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ABSTRACT

This is a report of a large scale survey conducted to meet the need for up-to-date information on the sources, types, and amounts of support available to graduate students, on the effects of stipend holding on academic progress and patterns of employment, and on other aspects of graduate education. The report is based on a sample of graduate students enrolled in accredited institutions during the spring term, 1963. Self-administered schedules were sent to 25,000 students enrolled for study in 37 detailed fields of study, encompassing the physical sciences, life sciences, behavioral sciences, engineering, and humanities. The data are based on questionnaires completed by 20,114 graduate students sampled from 130 schools. (HS)

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Report No. 103

graduate student finances, 1963

A SURVEY OF
THIRTY-SEVEN FIELDS
OF STUDY

by

Seymour Warkov

Bruce Frisbie

and

Alan S. Berger

U.S. DEPARTMENT OF HEALTH,
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SEPTEMBER, 1965

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GRADUATE STUDENT FINANCES, 1963

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Errata

Page	Line	
v	4	Introduction 1
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INTRODUCTION

Today manpower in the scientific and technical fields is considered to be in short supply. Correlatively, advanced training in these fields and financial support for all phases of higher education are issues currently undergoing close scrutiny by students of manpower and education both within and outside of the Federal government. To meet the need for up-to-date information on the sources, types, and amounts of support available to graduate students, on the effects of stipend holding on academic progress and patterns of employment and on other aspects of graduate education, the National Science Foundation asked the National Opinion Research Center to conduct a large scale survey in the spring of 1963 concerning these topics. The first report on some of the major findings was titled Subsidies for Graduate Students (Warkov, 1964).

This final report extends the analysis presented in the preliminary report and describes the financial academic and employment circumstances of students enrolled in American graduate schools in thirty-seven fields of study in the spring of 1963. These fields cover the physical sciences, life sciences, behavioral sciences, engineering, and several of the humanities. The data describing these fields were taken from self-administered questionnaires completed by 20,114 graduate students sampled from 130 graduate schools (see Appendix 4 for a copy of the questionnaire). A description of the sample design appears in Appendix 1, which also includes a list of participating institutions and rates of cooperation by school and by field of study. Some 82 per cent of the eligible students completed usable questionnaires by the time the forms were processed for the first report. The 20,114 students returning usable questionnaires were weighted up to 21,898 cases on the basis of procedures described in this appendix.

The study population consisted of students enrolled for graduate study during the spring term, 1963, for purposes of securing advanced degrees. Postdoctoral students who were enrolled for study were excluded from the analysis, as were students who had not met the usual requirements for graduate standing in their school or who did not intend to become formal candidates for a graduate degree.

The text and accompanying tables of this report are based on a composite field classification that reduces the fields sampled for study into five broad fields of graduate study: engineering; physical sciences; life sciences; behavioral sciences; and the humanities. The detailed fields of graduate study were assigned to each composite field as follows:

COMPOSITE FIELD OF GRADUATE STUDY[a]	DETAILED FIELD OF GRADUATE STUDY
Engineering	Chemical engineering
	Civil engineering
	Electrical engineering
	Mechanical engineering
	All other engineering fields
Physical sciences	Astronomy
	Chemistry
	General physical science
	Geography
	Geology and geophysics
	Mathematics
	Metallurgy
	Meteorology
	Oceonography
	Physics
	All other earth and physical sciences
Life sciences	Agriculture
	Anatomy
	Biochemistry
	Biophysics
	Botany
	Forestry
	General biology
	Genetics
	Microbiology
	Pathology
	Pharmacology
	Physiology
	Zoology
	All other biology fields
Behavioral sciences	Anthropology
	Economics
	Psychology
	Sociology
Humanities	English
	History

---

[a] Social work excluded from the analysis presented in the text of the report. This field was included in the set of special tabulations presented in Appendix 3 for all thirty-seven fields of graduate study.

The composite field level of analysis provides a broad overview of the basic set of fields of study covered in this survey. These composite fields comprise the forest, as it were, while the special set of detailed field tabulations presented in Appendix 3 afford the reader an opportunity to inspect the trees at closer range. The composite field analysis was derived from a self-weighted sub-sample secured on the basis of procedures described in Appendix 1. These procedures resulted in a sub-sample of 7,028 cases before exclusions. This sub-sample was used rather than the total sample for several reasons: first, the initial analysis was based on information processed on IBM unit record machines, especially the IBM 083 and 101 machines. Both the press of time and the scope of analysis initially planned dictated a reduction in the case base given the available data processing equipment. Second, different sampling ratios were used for each of the thirty-seven fields. Consequently, a multivariate analysis of the finances of graduate students in which the detailed fields were collapsed into broader categories was not feasible unless the cases were adjusted to take into account these different sampling ratios. Thus a combination of mechanical and technical constraints dictated the choice of the self-weighted sub-sample.

The reader will note that our composite field of humanities is based on two fields--history and English. Students in these two fields comprise approximately two-thirds of all students undertaking graduate work in the area of study usually designated as the humanities. While these are the two largest fields of study in the area of humanities, we wish to draw attention to the fact that this composite field was not as well sampled in terms of detailed fields of study as were the scientific and engineering fields. When we refer to the humanities fields in the text, our conclusions are based on data drawn from the two numberically most important fields of study in this general area. Furthermore, it should be emphasized that this study does not purport to represent all fields of graduate study. No conclusions may be drawn from the data presented in this survey concerning financial support in the field of education or in professional fields such as medicine, dentistry, or law. The reader is cautioned that our use of the term "stipends" and the classification of types of stipends follows a notational convention employed in other surveys conducted at NORC and does not conform to the various systems of classification that may be in use at other private and public agencies.

The reader should also bear in mind that the current pattern of support for graduate level study is immensely complicated and that the most seasoned observer often has difficulty in discerning the multiple institutional arrangements that enter into the financing of American graduate study. These considerations must be kept in the foreground in evaluating information on certain aspects of the financial underpinnings of higher education gathered from students by means of self-administered questionnaires. For example, some 7 per cent of the stipend recipients in this sample reported that their first stipend during the 1962-63 academic year was secured from "the school I am now attending, but I do not know the source."[1] On the other hand, who but the graduate student himself is best informed on all academic and nonacademic sources of and amounts of income and expenditures during the period under study? In the main, then, information presented in this report should be helpful to personnel and agencies responsible for the formulation of policies suitable for graduate level study in the sciences and engineering in the mid-sixties.

The chapters of this report are as follows:

Chapter I --Characteristics of Academic and Employment Fields--provides a portrait of the academic and employment characteristics of all bonafide graduate students in five composite fields of study in enrolled American graduate schools without regard to citizenship, a total of 6,814 students, both American citizens and aliens.

Chapter II --Stipend Holding in American Graduate Schools--describes the extent of stipend holding in the five composite fields of study; sources and types of stipends held during the academic year 1962-63; dollar amounts; and academic and other correlates of stipend holding. The discussion in this chapter and those that follow are based on students who were American citizens in spring, 1963. These total 5,936 cases unless otherwise indicated.

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[1] A special study was conducted to determine accuracy in reporting the source of stipends reported by one group of recipients: students reporting that they held a fellowship from the National Science Foundation during the academic year 1962-63. The results of this "validity" study are discussed in Appendix 7.

Chapter III--Enrollment for Graduate Study and Stipend Support--considers the pattern of part-time and full-time study in five composite fields; stipend support and other correlates of full-time study; readiness for full-time study and reasons for not studying full time.

Chapter IV --Institutional Correlates of Stipend Holding--analyzes the support pattern of students in terms of selected institutional characteristics of schools attended during the spring term, 1963.

Chapter V --Sources of Income--offers a detailed description of all sources and amounts of income reported by students in the five composite fields of study and traces the pattern of stipend and nonstipend support of students in various academic, institutional, and other categories.

Chapter VI --Expenses and Loans--presents a detailed analysis of the academic and nonacademic expenses incurred by students in the five composite fields of study during 1962-63; considers academic and certain other correlates of the pattern of expenditures; and also describes selected characteristics of students in these fields that are associated with reliance on loans for academic and other purposes during the year under study.

Chapter VII--The Delayed Doctorate--defines and describes the pattern of delay in the five composite fields of study among students who expect to secure the doctorate; considers the pattern of delay in terms of stipend holding, selected academic characteristics, and other personal and social aspects of graduate level study.

Chapter VIII--Summary of Findings--provides a review of the major findings of this survey.

CHAPTER 1

CHARACTERISTICS OF ACADEMIC AND EMPLOYMENT FIELDS

The inadequate supply of scientific and technical manpower has led to considerable research on the development of careers in scientific and professional occupations. At NORC alone, a number of studies (Davis, 1964, 1965; Greeley, 1963; Miller, 1963; Warkov, 1965) have documented the differences among college students that give rise to the choice of those career fields which entail graduate or professional study beyond the baccalaureate. These studies have delineated those social, psychological, and demographic variables which bear on the selection of one rather than another career field in occupations involving advanced study. The financial circumstances of persons in the midst of their graduate studies in the arts and sciences have been described as well (Davis, 1962).

Assuming that the nation's manpower requirements necessitate substantial growth among the scientific, professional, and technical components of the labor force, then the financial factor in graduate education may be a point of intervention for the purpose of facilitating the rapid completion of graduate degree programs. We know that social and intellectual factors are important in shaping career choice; however, there is very little that the policy planner can do about the social class origins, religious backgrounds, or academic potentials of college graduates currently entering the labor force or standing on the threshold of graduate study. But a society with a steadily increasing gross national product may well give attention to the role of scholarships, fellowships, and other kinds of financial support in attracting students to study programs in fields of scarce manpower supply and moving them through graduate school as rapidly as possible after they have been accepted for advanced study.

Government agencies whose mission is to foster the development of manpower adequate to the educational and research needs of this decade have supported fellowship programs for graduate students in scientific fields of study. Fellowships and other forms of stipend support have become an important but by no means sole source of income for a majority of graduate students. In his 1957 survey of arts and science students, Davis (1962, pp. 58-73) found that one out of four graduate students in arts and science fields depended on his spouse's employment for support. Furthermore, he found that fields of study differed substantially in the chances their students had for securing stipend support and in the types of stipend provided.

Again, in 1963, the present study found substantial variation by field of study in the pattern of stipend support; academic experiences also differed extensively in various fields of study.

If we are to comprehend these differences in financial support in the spring of 1963 among students enrolled in the fields selected for study in the present survey, then it is important to consider the students' financial conditions in the light of prevailing academic arrangements and employment patterns. In this chapter we document some of these differences between the composite fields of study and set the stage for subsequent analysis of materials that describe stipend and other forms of support for graduate study.

An Academic Portrait of the Fields of Study

Assessing the academic circumstances of the students enrolled for graduate study requires some understanding of their academic "origins," i.e., such academic background characteristics as undergraduate grade point average (GPA), field of bachelor's degree, whether the undergraduate degree was taken at the school in which student was presently enrolled, and the time gap between the recipt of the bachelor's degree and entry into graduate school. To take one example, did students in the several composite fields of graduate study differ on the basis of their undergraduate performance?

Table 1.1 shows that one-quarter of the entire sample had an undergraduate GPA of A or A-; another one-quarter reported a GPA of B+, while one-third scored an average of B or B-. Only one-tenth of the students in these fields averaged C+, and a handful were enrolled for graduate study in the spring of 1963, despite an undergraduate GPA of C. Not surprisingly, academic performance at the undergraduate level determined to a considerable extent whether a student was likely to be enrolled for advanced study in the fields under consideration in this survey.

TABLE 1.1

UNDERGRADUATE GRADE POINT AVERAGE BY COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Grade Point Average	Engineering	Physical Science	Humanities	Behavioral Science	Life Science	Total, Five Fields
A, A-	28	27	26	20	18	25
B+.	23	24	27	27	22	24
B, B-	36	36	35	37	41	37
C+.	10	10	9	11	14	11
C	2	3	3	3	4	3
Less than C .	*	*	*	1	*	*
Total	99[a]	100	100	99	99	100
N. . . .	1,568	1,796	940	1,146	1,169	6,619
NA, no B.A.	57	41	25	28	44	195
Total N	1,625	1,837	965	1,174	1,213	6,814

*Less than one-half of 1 per cent.

[a] Due to rounding error, percentages vary from 99 to 101.

Though it does not take into account differences in quality of the undergraduate institution, the table does demonstrate differences between the five composite fields in their recruitment of talented students. The highest proportion of students whose undergraduate GPA was A or A- was enrolled in engineering (28 per cent), the physical sciences (27 per cent), and the humanities (26 per cent), while the remaining fields did not fare as well in drafting students from the top quarter of the sample: in the behavioral sciences only 20 per cent and in the life sciences only 18 per cent did A or A- work as undergraduates. Presumably talent and stipend support for graduate study in these fields should go hand in hand; in Chapter 2 it will be shown that this is not necessarily the case.

There is a widely shared belief in higher education that it is beneficial for undergraduates to move on to other institutions in order to be exposed to a variety of new intellectual perspectives. This does appear to be the prevailing pattern: three out of four students in this sample were in fact studying at institutions other than the one at which the bachelor's degree was taken. Institutional mobility occurred most frequently among students enrolled for graduate study in the physical sciences: fully 80 per cent had left their alma maters to take graduate degrees at another school. Engineering graduate students were least likely to have moved, but even in this group two out of three students were no longer at the institutions granting their bachelor's degrees (Table 1.2).

The fact that the overwhelming majority of students changed institutions does not imply discontinuity in field of study, however. On the contrary: the undergraduate major is the best predictor available of graduate studies. Table 1.3 shows that close to eight out of ten students in the sample were still in the same general field of study pursued at the undergraduate level.

Nevertheless, field differences were found in the proportion of students whose composite undergraduate field of study coincided with their graduate field in the spring of 1963. The lowest turnover in fields of study occurred among engineers: 92 per cent of this group of graduate students had received their bachelor's degree in the same field. Physical science ranked second in homogeneity of field origins, with some eight out of ten completing their undergraduate work in a physical science field of study. Of the remainder, 10 per cent had engineering backgrounds, another 3 per cent took education degrees in natural science fields of study, and the rest were scattered among other undergraduate fields. The humanities ranked third among the five composite fields in the proportion

TABLE 1.2

UNDERGRADUATE ORIGINS BY COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Undergraduate School and Graduate School	Physical Science	Life Science	Behavioral Science	Humanities	Engineering	Total, Five Fields
Different	80	74	74	73	68	74
Same.	20	26	26	27	33	26
Total per cent . .	100	100	100	100	101	100
N.	1,799	1,172	1,153	941	1,576	6,641
NA, no B.A.	38	41	21	24	49	173
Total N. . .	1,837	1,213	1,174	965	1,625	6,814

TABLE 1.3

FIELD OF UNDERGRADUATE MAJOR BY COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Field of Undergraduate Major	Engineering	Physical Science	Humanities	Life Science	Behavioral Science
Engineering . . .	92	11	*	2	3
Physical science.	6	80	2	12	4
Humanities. . . .	*	1	76	2	12
Life science. . .	*	2	1	74	5
Behavioral science	*	1	8	*	65
Education	*	3	11	6	4
Health.	-	*	*	3	1
Other	1	1	2	1	7
Total. . . .	99	99	100	100	101
N.	1,615	1,831	956	1,201	1,170
NA, no B.A..	10	6	9	12	4
Total N. . .	1,625	1,837	965	1,213	1,174

*Less than one-half of 1 per cent.

taking undergraduate degrees in their 1963 fields of study (76 per cent), with one in ten moving in from education and close to one in ten shifting from a behavioral science field. Similarly, three out of four students undertaking graduate work in the life sciences at the time of the survey were in the same composite field of study in college. Of the remainder, some 12 per cent were formerly in the physical sciences (almost all concentrated in chemistry), and 6 per cent were formerly in education (with specialties in natural sciences). It is noteworthy that the behavioral sciences had the highest proportion of students with undergraduate origins in other fields of study: 12 per cent of the behavioral science students in graduate schools reported a humanities field as their major during college, "other" fields accounted for 7 per cent (the bulk were law or pre-law), and 5 per cent had switched from the life sciences. In sum, when the composition of the five broad fields of graduate study is characterized by the undergraduate field of study, the behavioral sciences especially were accessible to students from other fields while engineering was the most inbred of the fields included in this survey. More important, the vast majority of these students maintained their undergraduate field. Thus continuity rather than change seems to be characteristic when a comparison is made between bachelors' and post-bachelors' field of study.

If higher education is seen as a pipeline that channels America's manpower into a variety of occupational and professional streams (and the above findings support this point of view), then a delay of one year or more in initiating graduate study after the completion of the undergraduate program may indicate that there are obstructions to the most efficient utilization of the system. In reply to the question "How many calendar years elapsed between the time you received your bachelor's degree and the start of your graduate studies." close to two out of three (62 per cent) reported that graduate study was initiated during the calendar year immediately following completion of the bachelor's program. Table 1.4 shows that the remaining one out of three experienced a hiatus of at least one year: 9 per cent of the sample circled "one year" and another 7 per cent indicated that two years elapsed before graduate study began. A lapse of four years or less accounts for more than 85 per cent of the sample, with the remainder taking five or more years off from formal study before beginning graduate work.

TABLE 1.4

HIATUS BETWEEN COLLEGE GRADUATION AND START OF GRADUATE SCHOOL, BY COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Length of Hiatus	Physical Science	Behavioral Science	Life Science	Humanities	Engineering	Total, Five Fields
Less than 1 year. . .	68	66	61	58	57	62
1 year. . . .	8	9	8	12	10	9
2 years . . .	6	6	8	8	9	7
3 years . . .	5	4	5	6	6	5
4 years . . .	4	3	3	3	4	4
5-9 years . .	6	7	9	8	10	8
10 or more years . . .	4	6	5	6	5	5
Total. .	101	101	99	101	101	100
N. . . .	1,802	1,152	1,172	944	1,582	6,652
NA, no B.A.	35	22	41	21	43	162
Total N.	1,837	1,174	1,213	965	1,625	6,814

Physical science and behavioral science students were somewhat more likely than students in other fields to enter graduate school less than one year after receiving their bachelors' degrees, while humanities and engineering students were less likely to do so, furthermore, inspection of Table 1.4 shows that physical science had the lowest proportion of students reporting a hiatus of five years or more (10 per cent), while the remaining fields had almost identical proportions of students who were out of school for this amount of time (about 15 per cent in each field).

Variations by field of study notwithstanding, the majority of students in all fields of graduate study covered in this survey (1) were engaged in graduate study at an institution other than the one in which the bachelor's degree was taken; (2) continued in the same general field of study in which the undergraduate degree was secured; and (3) initiated graduate study within twelve months after completing their undergraduate studies.

Academic Characteristics, Spring, 1963

We have shown that graduate students in the sciences, engineering, and certain of the humanities can be measured by a yardstick of their bachelor's degree origins; on the whole these students experienced institutional mobility, continuity in fields of study, and relatively uninterrupted study activity in the transition from college to graduate school. What about their academic circumstances? How many students in the five composite fields were working for the doctorate? What was their enrollment status? In this section we will describe these and other characteristics of their collective academic activity.

Table 1.5 shows that one out of three students in the sample carried a full course load in a program that permitted "full-time" study; another three out of ten were carrying less than a full course load in this type of program, and two out of ten considered their enrollment for graduate study primarily in terms of thesis work, independent research, and the like. Some 14 per cent said they were enrolled for work at a night school or in a program that did not permit full-time study. According to these students, a great majority of the sample were not registered for full-time course work during the spring term.

Substantial field differences in the pattern of course work occurred: Engineering and humanities were less likely to have students carrying a full course load, but close to one-half of the students in behavioral science were in this category. The most striking field differences pertained to night school attendance or enrollment in a program that precluded full-time study: some 26 per cent of the engineering students reported this to be the case in contrast with 15 per cent in humanities, 14 per cent in physical sciences, and only 5 per cent in life and behavioral sciences.

Often a number of academic requirements are faced simultaneously by the student. It is not unusual to take one or more courses, prepare for comprehensive examinations, and also allocate time for the development of thesis proposals during any given term. Table 1.6 shows that some three out of four (77 per cent) of the students were taking courses or seminars, and over four out of ten (43 per cent) were engaged in research for and preparation of the dissertation. One out of five was preparing for comprehensive or qualifying examinations and some 15 per cent were working at

TABLE 1.5

SPRING, 1963, REGISTRATION BY COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Enrollment Status	Behavioral Science	Life Science	Physical Science	Humanities	Engineering	Total, Five Fields
Full course load or greater . .	43	37	35	30	28	34
Less than full course load. . . .	30	31	27	36	27	30
No courses; thesis or independent research only. . . .	22	27	24	19	18	22
Night school or other program in which full-time study is impossible . . .	5	5	14	15	26	14
Correspondence courses . .	*	*	-	*	*	*
Total. .	100	100	100	100	99	100
N. . . .	1,159	1,181	1,790	937	1,588	6,625
NA . . .	15	32	47	28	37	159
Total N.	1,174	1,213	1,837	965	1,625	6,814

*Less than one-half of 1 per cent.

their foreign language requirements. Because of their frequent enrollment in night school programs, it is not surprising to learn that engineering students were less likely than others to be involved in comprehensives or taking language examinations.

Differences in enrollment status and in the kinds of academic requirements that these graduate students were facing in Spring 1963, were reflected in the amount of time allocated to study. Table 1.7 shows responses to the question "On the average, how many hours a week were you engaged in academic study this term? Include thesis work, courses, practicum, study time, etc., required for the degree." There was a broad spread in the amount of time graduate students committed to academic study. At the one extreme, one in ten gave less than ten hours a week to academic work, and at the other, another one in ten students spent an average of seventy hours a week or more in these activities. Students at each end of the time band obviously lived in different worlds; to say that both groups are "graduate students" hardly captures their respective life styles.

TABLE 1.6

DEGREE REQUIREMENTS BEING WORKED ON IN SPRING TERM, 1963, BY COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Degree Requirements	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total, Five Fields
Courses or seminars. .	74	80	72	78	79	77
Preparing for qualifying comprehensive exams . . .	23	12	17	23	21	19
Languages exams . . .	16	9	19	16	16	15
Research for and preparation of thesis. . .	46	36	59	42	28	43
Other	2	2	4	4	3	3
None.	*	*	-	-	*	*
Total. .	161[a]	139	171	163	147	157
N. . . .	1,828	1,608	1,210	1,166	958	6,770
NA . . .	9	17	3	8	7	44
Total N.	1,837	1,625	1,213	1,174	965	6,814

*Less than one-half of 1 per cent.

[a] Adds to more than 100 per cent because of multiple responses.

TABLE 1.7

HOURS PER WEEK IN ACADEMIC STUDY BY COMPOSITE FIELD OF GRADUATE STUDY

Hours Per Week in Academic Study	Engineering	Humanities	Physical Science	Behavioral Science	Life Science	Total, Five Fields
Less than 10.	15	12	9	7	4	10
10-19	20	18	13	12	10	15
20-39	22	26	22	27	19	23
40-59	26	28	34	35	33	31
60-69	9	10	13	13	18	13
More than 69.	7	6	9	6	15	9
Total. .	99	100	100	100	99	101
N. . . .	1,603	952	1,813	1,162	1,200	6,730
NA . . .	22	13	24	12	13	84
Total N.	1,625	965	1,837	1,174	1,213	6,814

Across the board, one-fourth of the sample gave less than twenty hours a week to graduate study, close to one-fourth (23 per cent) studied twenty to thirty-nine hours weekly, about three in ten reported forty to fifty-nine hours of academic work per week, and another 22 per cent were spending an average of sixty hours per week or more on academic activity.

Composite differences in the allocation of time to academic work were consistent with what was discerned on enrollment and academic requirements: Engineering students were least likely to give substantial amounts of time to academic work. Some 15 per cent of these students gave less than ten hours per week to academic work and over one-third studied less than twenty hours weekly.[1] One-third of the life science students studied an average of sixty hours weekly or more, followed, in descending order, by students in the physical sciences, behavioral sciences, humanities, and engineering. Thus, fields differed substantially in the amount of time their graduate students devoted to academic endeavor. As we will see later, fellowships, scholarships, and other types of financial support for graduate study had an important influence on the types of enrollment that prevailed in each of these composite fields.

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[1] A majority of engineering students were enrolled for part-time study and many were employed in a regular full time job (see Table 1.18). Also, differences in the nature of the programs offered in these fields of study influenced the amount of time given to academic study.

Despite the variation in course loads, academic requirements on which students were working, and the amount of time they were giving to their graduate study, the great majority of these students were working toward the same goal: a doctorate. Fully 77 per cent of the sample said they were aiming at a doctorate in their present or future study program. Save for a handful who were enrolled for a "first professional degree," the remainder expected the master's as their terminal degree. Variations by field of study have a familiar ring: one-third of the engineering students and one-fourth of those in the humanities expected to stop at the master's level in contrast with 18 per cent in the physical sciences, 14 per cent in the life sciences, and only 13 per cent in the behavioral sciences (Table 1.8).

TABLE 1.8

HIGHEST DEGREE EXPECTED BY COMPOSITE FIELD OF GRADUATE STUDY

Highest Degree Expected	Per Cent Expecting Degree					
	Behavioral Science	Life Science	Physical Science	Humanities	Engineering	Total, Five Fields
First professional. . .	*	3	*	*	1	1
Master's. . .	13	14	18	25	37	22
Doctorate . .	87	82	81	74	62	77
Other	*	*	*	*	*	*
Total. .	100	99	99	99	100	100
N. . . .	1,156	1,202	1,802	947	1,589	6,696
NA . . .	18	11	35	18	36	118
Total N.	1,174	1,312	1,837	965	1,625	6,814

With the exception of engineering, students in every field who were aming for the doctorate as their highest degree were more likely to report that the degree was to be taken in their present field of study than was the case among the students aiming for the master's as the terminal degree.

According to Table 1.9, 72 per cent of the behavioral science students expecting the master's (to take one example) planned to take this highest degree in a behavioral science field, while the corresponding percentage among students who expected the doctorate was 91. As for engineering students, few of them came in from other undergraduate fields and scarcely any expected to transfer to other fields to take their highest degree: 97 per cent of those seeking the master's and 92 per cent of those aiming for the doctorate expected their highest degree in engineering.

Ignoring for the moment whether the highest degree expected is a doctorate or a master's, Table 1. 10 shows that only 14 per cent of the sample expected to receive their terminal degree during 1963. By the end of 1964, however, about four out of ten said they would be through with their graduate study. Skipping to the end of 1966, eight out of ten students should have the highest degree they expect to receive in graduate school. Interestingly, there are only minor differences by field when students are compared across the board in terms of expected duration of graduate study.

TABLE 1.10

ANTICIPATED DATE OF HIGHEST DEGREE EXPECTED AND COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Anticipated Date of Highest Degree Expected	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total, Five Fields
1963.	15	17	14	14	10	14
1964.	25	25	25	25	21	24
1965.	23	21	23	25	21	23
1966.	17	16	17	17	19	17
1967.	9	7	8	9	10	9
1968.	5	6	7	5	8	6
1969.	2	2	2	2	3	2
1970.	4	4	2	2	6	4
After 1970. .	1	2	1	1	3	1
Total. .	101	100	99	100	101	100
N. . . .	1,679	1,470	1,106	1,080	822	6,157
NA . . .	158	155	107	94	143	657
Total N.	1,837	1,625	1,213	1,174	965	6,814

TABLE 1.9

COMPOSITE FIELD OF GRADUATE STUDY, HIGHEST DEGREE EXPECTED, AND COMPOSITE FIELD OF STUDY FOR HIGHEST DEGREE

(Per Cent in Field of Study for Highest Degree)

Highest Degree Expected	Physical Science	Engineering	Health Fields	Life Science	Behavioral Science	Education	Humanities	Others	Per Cent	N	NA	Total
Physical science												
Master's	80	5	-	2	1	11	-	1	100	325	1	326
Doctorate. . . .	94	2	-	2	-	1	-	-	99	1,462	5	1,467
							Total					1,793
							Others, including NA.					44
							Total N.					1,837
Engineering												
Master's	1	97	-	-	-	-	-	1	99	586	4	590
Doctorate. . . .	6	92	-	1	-	-	-	-	99	970	9	979
							Total					1,569
							Others, including NA.					56
							Total N.					1,625
Life science												
Master's	2	1	2	80	1	14	-	1	100	166	1	167
Doctorate. . . .	2	-	2	93	-	3	-	-	100	982	6	988
							Total					1,155
							Others, including NA.					58
							Total N.					1,213
Behavioral science												
Master's	1	-	1	6	72	8	2	9	99	143	2	145
Doctorate. . . .	-	-	-	1	91	5	1	1	99	999	3	1,002
							Total					1,147
							Others, including NA.					27
							Total N.					1,174
Humanities												
Master's	-	-	-	-	1	20	79	-	100	231	3	234
Doctorate. . . .	-	-	-	-	3	6	90	1	100	697	7	704
							Total					938
							Others, including NA.					27
							Total N.					965

When fields are further broken down by the highest degree expected (as shown in Table 1.11), the following results obtain:

1. Life and behavioral science students expecting to terminate their graduate study with the master's degree indicated that they would secure the degree at a more rapid pace than students in the other fields of study: Only one in five students in these two fields planned still to be working for the master's degree by the end of 1964. In contrast, from 32 to 37 per cent of the students in the physical sciences, engineering, and the humanities said they would not have their terminal master's by the end of 1964.
2. The pattern by composite field among students seeking the doctorate was quite different. Close to one-third of the students in every field except the humanities expected to secure this degree by the end of 1964; but only one-fifth of the humanities students aiming for the doctorate as their highest degree thought they would finish so soon.[2] The gap between the humanities and the remaining fields of study in time taken to complete the doctoral program was expected to persist through the calendar years of 1965 and 1966.

However, this does not tell the whole story. For in distinguishing between those students seeking the master's degree and the doctorate we have not considered that some of those seeking the doctorate will also acquire a master's along the way, and some will not.[3]

Students were classified on the basis of three questions: "What is the highest degree you now hold?" "What is the next degree you expect to receive?" "What is the highest degree you expect?"

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[2] This table shows data that forecast certain outcomes: only a follow-up survey could determine whether these expectations are realized. Other sources indicate substantial variation among the scientific and engineering fields in the mean B.A. to Ph.D. time lapse among doctoral recipients, 1960-61 (see Harmon and Soldz, 1963, pp. 42-43).

[3] This is not always a matter of choice for the graduate student who must conform to the rules and regulations of his school and department. In some schools and in certain fields of study, students may skip the master's and proceed directly to the doctorate. We did not distinguish between schools and fields of study in which the sequence of degree programs is mandatory or optional.

TABLE 1.11

COMPOSITE FIELD OF GRADUATE STUDY, HIGHEST DEGREE EXPECTED, AND ANTICIPATED DATE

(Per Cent Expecting Degree During Year)

Highest Degree Expected	1963	1964	1965	1966	1967	All Others	Per Cent	N	NA	Total
Physical science										
Master's	26	39	18	8	6	3	100	298	28	326
Doctorate. . . .	12	22	24	20	10	13	101	1,365	102	1,467
						Total				1,793
						Others, including NA. .				44
						Total N.				1,837
Engineering										
Master's	28	33	19	13	5	3	101	549	41	590
Doctorate. . . .	11	20	22	18	9	20	100	903	76	979
						Total				1,569
						Others, including NA. .				56
						Total N.				1,625
Life science										
Master's	32	44	15	3	3	3	100	158	9	167
Doctorate. . . .	12	22	24	19	9	14	100	905	83	988
						Total				1,155
						Others, including NA. .				58
						Total N.				1,213
Behavioral science										
Master's	40	37	11	4	6	1	99	134	11	145
Doctorate. . . .	11	23	28	18	9	11	100	931	71	1,002
						Total				1,147
						Others, including NA. .				27
						Total N.				1,174
Humanities										
Master's	23	42	18	9	5	3	100	209	25	234
Doctorate. . . .	6	14	22	22	11	26	101	605	99	704
						Total				938
						Others, including NA . .				27
						Total N.				965

While further refinements are possible, there are, broadly speaking, three types of students. These are: (1) students expecting a terminal master's degree (21 per cent of the sample); (2) students going on for both the master's and the doctorate (67 per cent of this sample); and (3) students expecting to take the doctorate without stopping for the master's degree (12 per cent).

With this information on hand, it is possible to learn something about the academic routes taken by these students and the variations in behavior that are involved in reaching their goals. For example, Table 1.12 shows that these three types of students differed in the extent to which their graduate field of study corresponded to their undergraduate majors.

With the exceptions of engineering and life science students, graduate students expecting a terminal master's degree were less likely to have continued in their undergraduate fields of study than those graduate students expecting both a master's and a doctorate. The latter students were less likely to report the same field for both undergraduate and graduate study than those going on directly for the doctorate. We would expect this type of pattern because those who (regardless of field) plan to stop with the master's degree are the ones least likely to require depth of knowledge in their field. They may start from scratch after taking a bachelor's degree in another field and satisfy the requirements for the master's degree after relatively short exposure to the subject matter of the new field. On the other hand, the bachelor's recipient going directly on for the doctorate can more readily expect to bypass the master's degree if he seeks the doctorate in his undergraduate field of study.

The two fields which do not fit the pattern of findings described above, engineering and the life sciences, are perhaps special cases. In engineering very few students expected to go directly from the bachelor's degree to the doctorate. Almost identical percentages of those who wanted the terminal M.A. or the M.A. combined with the Ph.D. had engineering as both their undergraduate and graduate fields.

In the life sciences one-fourth of the students going directly from the bachelor's to the doctorate had their undergraduate training in the physical sciences. This reflects the many advances made in the biophysical fields in recent years, and the close relationship that has developed between

TABLE 1.12

FIELD OF STUDY, DEGREE SOUGHT, AND FIELD OF UNDERGRADUATE MAJOR

Field of Study	Degree Sought	Field of Undergraduate Study								Total Per Cent	N
		Physical Science	Engineering	Life Science	Health Professions	Behavioral Science	Humanities	Education	Other		
Physical science	Terminal Master's . .	68	14	2	1	1	3	8	2	99	309
	Master's and Doctorate	81	12	1	*	1	2	2	1	101	1,108
	Doctorate only. . . .	91	5	1	1	*	*	1	-	99	350
Engineering	Terminal Master's . .	5	94	-	-	-	1	-	1	101	556
	Master's and Doctorate	7	92	*	-	*	*	*	*	99	905
	Doctorate only. . . .	11	89	*	-	-	-	-	-	100	62
Life sciences	Terminal Master's . .	7	2	69	4	1	2	13	1	99	158
	Master's and Doctorate	10	1	77	3	*	2	6	*	99	806
	Doctorate only. . . .	25	1	67	2	*	3	1	-	99	153
Behavioral science	Terminal Master's . .	3	2	14	2	49	9	4	16	99	137
	Master's and Doctorate	4	3	3	1	66	12	4	6	99	832
	Doctorate only. . . .	6	4	3	-	75	8	1	3	100	155
Humanities	Terminal Master's . .	*	-	*	*	6	69	22	2	99	220
	Master's and Doctorate	2	*	1	-	9	78	8	2	100	665
	Doctorate only. . . .	-	-	-	-	7	89	4	-	100	27
Total, Five Fields	Terminal Master's . .	18	41	10	1	6	13	7	3	99	1,380
	Master's and Doctorate	25	23	16	1	15	15	4	2	101	4,316
	Doctorate only. . . .	50	11	15	1	16	6	1	1	101	747

N	6,443
NA Field or degree.	371
Total.	6,814

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*Less than one-half of 1 per cent.

them. Thus graduate biological science students frequently take their undergraduate training in the physical sciences and then move over to the biological sciences for the doctorate. Changes of fields of study seldom occur in the opposite direction, however.

Students going directly on for the doctorate generally maintained a graduate field that was the same or closely related to their undergraduate field of study, but they were more likely to switch schools to do so. Table 1.13 shows that with the sole exception of engineering students, those taking the direct B.A.-to-Ph.D. route left their undergraduate school more frequently than either terminal M.A. students or those expecting both the M.A. and Ph.D. Colleges and their faculties evidently advise their

TABLE 1.13

FIELD OF STUDY, DEGREE SOUGHT, AND INSTITUTIONAL MOBILITY

(Per Cent Moving from Their Undergraduate Institution)

Field of Study	Degree Sought		
	Terminal Master's	Master's and Doctorate	Doctorate Only
Physical science.	75 (304)	79 (1,087)	86 (349)
Engineering	68 (552)	66 (883)	64 (62)
Life science.	60 (160)	75 (786)	82 (151)
Behavioral science.	51 (136)	77 (84)	78 (154)
Humanities	63 (217)	77 (656)	88 (25)
Total, five fields.	66 (1,369)	75 (4,233)	82 (741)

N.	6,343
NA schools/degrees . . .	471
Total.	6,814

undergraduates to go elsewhere for their graduate training, and a majority have taken this advice. However, the terminal M.A. candidates were less likely to do so than those who wanted both the M.A. and Ph.D. Fewer of the latter, in turn, switched schools than did those who wanted to go on directly for the Ph.D.[4]

Just as the student going directly for the Ph.D. stayed in the same field and left his undergraduate college for another graduate school more frequently than the students expecting only an M.A., or an M.A. and a Ph.D., so he more readily entered graduate school directly upon receipt of his B.A.

TABLE 1.14

FIELD OF STUDY, DEGREE SOUGHT, AND ELAPSED TIME BETWEEN RECEIPT OF BACHELOR'S AND INITIATION OF GRADUATE STUDY
(Per Cent)

Field of Study	Degree Sought	Hiatus Between Bachelor's and Graduate Entrance				Total	N
		Less Than 1 Year	1 Year	2 Years	3 Years or More		
Physical science	Terminal Master's	50	11	6	32	99	306
	Master's and Doctorate	69	8	7	15	99	1,099
	Doctorate only	80	5	3	11	99	350
Engineering	Terminal Master's	45	11	9	35	100	555
	Master's and Doctorate	63	10	9	16	98	898
	Doctorate only	72	5	6	16	99	62
Life science	Terminal Master's	43	9	8	38	98	159
	Master's and Doctorate	60	8	9	22	99	799
	Doctorate only	77	9	5	9	100	150
Behavioral science	Terminal Master's	42	10	12	36	100	137
	Master's and Doctorate	67	8	6	18	101	827
	Doctorate only	78	10	2	10	100	154
Humanities	Terminal Master's	49	15	8	27	99	219
	Masters and Doctorate	60	12	7	21	100	660
	Doctorate only	74	4	18	4	100	27
Total, five fields	Terminal Master's	46	11	10	34	101	1,376
	Masters and Doctorate	66	9	8	18	100	4,283
	Doctorate only	78	7	4	10	99	743

N. 6,402
NA, elapsed time/degree. . . . 412
Total. 6,814

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[4] For data concerning transfer patterns *among* graduate schools, see Wilson (1965, p. 166). Further clarification of the pattern shown in Table 1.13 would be possible if data were on hand on the availability of a graduate school.

Table 1.14 shows that in all fields of study the group going on directly for the doctorate were least likely to defer graduate study: they had the highest percentage of those who allowed less than a year to elapse between the B.A. and entry into graduate school. Also, except for those in engineering, they were least likely to wait three years or more.

It is clear from the preceding that the students who anticipated going directly from their bachelors' to their doctorate are the ones who follow all academic rules in reaching for the "union card." They stay in the same field; they change schools after taking the bachelor's; they let as little time as possible elapse before starting graduate study.

TABLE 1.15

FIELD OF STUDY, DEGREE SOUGHT, AND EXPECTED DATE OF TERMINAL DEGREE

(Per Cent)

Field of Study	Degree Sought	Expected Date of Completion					Total	N
		1963	1964	1965	1966	1967 and Up		
Physical science	Terminal Master's	26	38	18	8	9	99	286
	Master's and Doctorate	9	19	23	20	29	100	865
	Doctorate only	18	28	27	22	5	100	307
Engineering	Terminal Master's	25	33	19	14	9	100	491
	Master's and Doctorate	12	18	21	16	33	100	640
	Doctorate only	4	50	31	12	2	99	48
Life science	Terminal Master's	33	44	14	3	5	99	147
	Master's and Doctorate	12	21	21	16	29	99	584
	Doctorate only	13	26	29	27	6	101	134
Behavioral science	Terminal Master's	38	38	12	5	8	101	121
	Master's and Doctorate	12	22	25	19	21	99	682
	Doctorate only	10	25	35	18	12	100	146
Humanities	Terminal Master's	23	43	18	8	9	101	201
	Master's and Doctorate	6	14	22	22	35	99	556
	Doctorate only	4	17	50	29	-	100	24
Total, five fields	Terminal Master's	27	38	18	10	8	101	1,246
	Master's and Doctorate	12	20	21	18	29	100	2,329
	Doctorate only	4	28	30	22	6	100	659

N	5,232
NA degrees or dates	704
Aliens.	878
Total	6,814

Table 1.15 presents the date on which the terminal degree was anticipated. While the terminal M.A. students generally anticipated getting their degrees first, this was to be expected since these requirements are neither extensive nor time consuming. When students taking the master's en route to the Ph.D. are compared with those skipping the master's, however, those going directly for the doctorate are expected to get their degree sooner than those taking the B.A.-M.A.-Ph.D. route.

Comparing the percentage of each group expecting the degree in 1967 or later, between 21 and 33 per cent of the students planning on both the M.A. and the Ph.D. (depending on field of study) expected their degrees after 1966. On the other hand, 12 per cent or fewer of the students working for only a Ph.D. expected to wait this long to get their highest degree. It is clear that students going straight on for the Ph.D. were in a greater hurry for their highest degree than those who expected both the M.A. and Ph.D. Not only were they following the rules more closely, but they expected that this would pay them the dividend of getting their degrees faster.

Finally, as shown in Table 1.16, students going directly on for the doctorate without an intervening master's degree also spent more time at their academic study than did the other two groups. Generally, terminal master's students committed the least time to academic work in the spring of 1963. Students planning on both degrees were in the middle.

In summary, the great majority of graduate students in the five composite fields were enrolled for course work during the spring term, but less than a majority were involved in course work full time. A substantial minority of the engineering students were enrolled in a night school program or some other program that eliminated the possibility of full-time study. About one-half of these graduate students in the five composite fields said that they were giving forty hours or more to academic affairs, but students in the humanities and engineering were less likely than others to devote that much time to study. Almost 40 per cent of the students expected to receive their terminal degrees by the end of 1964. Furthermore, a great majority of all students expected to continue graduate studies up to the doctorate, although a significant minority of those in engineering and in the humanities anticipated their master's degrees as being terminal. Most students expected to acquire a master's degree along the way to their

TABLE 1.16

FIELD OF STUDY, DEGREE SOUGHT, AND AVERAGE NUMBER OF HOURS SPENT PER WEEK IN ACADEMIC STUDY

(Per Cent)

Field of Study	Degree Sought	Average Number of Hours			Total	N
		Less Than 10	10-39	40 and Up		
Physical science	Terminal Master's	26	48	26	100	308
	Master's and Doctorate	6	34	60	100	1,095
	Doctorate only	3	21	76	100	348
Engineering	Terminal Master's	27	50	23	100	545
	Master's and Doctorate	8	39	52	99	904
	Doctorate only	-	16	84	100	62
Life science	Terminal Master's	12	37	50	99	161
	Master's and Doctorate	2	31	67	100	799
	Doctorate only	1	18	81	100	152
Behavioral science	Terminal Master's	19	55	26	100	134
	Master's and Doctorate	6	39	55	100	828
	Doctorate only	4	25	71	100	154
Humanities	Terminal Master's	21	56	23	100	215
	Master's and Doctorate	10	40	50	100	664
	Doctorate only	4	15	81	100	27
Total, five fields	Terminal Master's	23	49	27	99	1,363
	Master's and Doctorate	6	36	57	99	4,290
	Doctorate only	2	21	77	100	743

N. 6,396
NA degree/hours. 418
Total. 6,814

doctorate, but those who did not were more likely to have continued in their undergraduate field of study and were expecting their doctorate at an earlier date than those who did.

Given these variations in academic circumstances, it is clear that a substantial number of graduate students were committing much of their time to nonacademic pursuits which centered primarily around employment. In the section that follows we will document some of the conditions of graduate student employment during the academic year 1962-63.

Employment Characteristics, Spring, 1963

Conditions of employment, like academic programs of study, differed significantly from one to another of the five composite fields. Minimal involvement in academic study within any given field probably implied major commitments to employment beyond the academic pale, i.e., nonstipend employment. By nonstipend employment we mean any form of employment other than that required by virtue of holding a duty stipend, be it a research assistantship or a teaching assistantship, or the occasional job of only a few days' duration. Table 1.17 shows that over one-half of the sample (57 per cent) held nonstipend employment at some time during the academic year 1962-63. How much time was spent in this employment? In which fields? For what kind of employer? Involving what kind of work?

TABLE 1.17

NONSTIPEND EMPLOYMENT AND COMPOSITE
FIELD OF GRADUATE STUDY

(Per Cent)

Any Nonstipend Employment	Engineering	Humanities	Behavioral Science	Physical Science	Life Science	Total, Five Fields
Yes	71	61	58	52	42	57
No.	29	39	42	48	58	43
Total.	100	100	100	100	100	100
N.	1,618	962	1,174	1,835	1,211	6,800
NA	7	3	-	2	2	14
Total N. . . .	1,625	965	1,174	1,837	1,213	6,814

As seen in Table 1.17, engineering students reported the highest rate of nonstipend employment of any group in the sample--seven out of ten were so employed. Similarly, six out of ten students in the humanities had such employment during the academic year 1962-63 in contrast to only four out of ten life science students. In fact, rates of nonstipend employment in these five composite fields of study had almost the same rank order as found in Table 1.7--the percentage of each field committing less than twenty hours weekly to academic study. Thus the less time allocated to study, the higher the rate of nonstipend employment in each field.

Two factors should be considered in describing the employment pattern: the number of hours of employment per week and the number of months of employment during the period under study. These aspects of employment were combined in Table 1.18: (1) students employed thirty-five hours or more per week were classified as working full-time; and (2) the duration of full-time employment was divided into (a) regular full-time employment (ten to twelve months during the period of June, 1963, through July, 1963); (b) sporadic full-time employment (four to nine months); and (c) occasional full-time employment (three months or less).

TABLE 1.18

EXTENT OF FULL-TIME NONSTIPEND EMPLOYMENT AND COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Extent of Full Time Nonstipend Employment	Engineering	Physical Science	Humanities	Life Science	Behavioral Science	Total, Five Fields
Regular full-time:						
10-12 months. . .	54	36	36	29	29	40
Sporadic full-time:						
4-9 months. . . .	10	11	15	13	12	11
Occasional full-time:						
3 months or less.	36	53	49	59	60	50
Total.	100	100	100	101	101	101
N.	1,134	943	577	503	676	3,833
Not employed any months for 35 hrs. week	475	879	379	706	489	2,928
NA on employment	16	15	9	4	9	53
Total N . . .	1,625	1,837	965	1,213	1 174	6,814

Among the students reporting nonstipend employment, about four in ten were employed full time during the twelve months under consideration. Thus a substantial minority of the total sample of students enrolled for graduate study (23 per cent) undertook study programs after a full day's work. When employed, one student out of ten worked from four to nine months on a full-time basis. One out of every two or those enrolled for graduate study in the spring of 1963, reporting some form of nonstipend employment, held a full-time job that was probably seasonal (i.e., required thirty-five hours or more weekly for three months or less during the twelve-month period). In the main, graduate students with full-time employment were on either a regular or a seasonal basis; very few moved in and out of full-time employment sporadically.

The highest proportion of students with regular full-time employment among those employed were found among engineering students: some 54 per cent were so employed as were over one-third (36 per cent) each in the physical sciences and the humanities, in contrast with 29 per cent in both the life and the behavioral sciences. Since there were no field differences in the incidence of sporadic full-time employment, fields of study that were low on rates of regular full-time employment were high on occasional employment, with behavioral science and life science students most frequently reporting this form of nonstipend employment.

In which fields were these graduate students employed? Considering the jobs held longest during the period under study, the field with the highest rate of nonstipend employment was engineering (33 per cent), followed by the physical sciences (18 per cent) (Table 1.19). There were substantial differences in the extent of concentration of employment in one's field of study. Some 91 per cent of the engineering students with nonstipend employment, followed by 65 per cent of the life science students, were working in their own fields of study. Two-thirds of the physical science students also held jobs in their own fields. The link between field of study and field of nonstipend employment was weaker in the behavioral sciences: only 57 per cent of these students were in behavioral science fields of employment. The most extensive movement beyond field of study occurred in the humanities, with fully seven out of ten students holding nonstipend employment in other fields.[5]

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[5] Note that employment refers to the job held longest during the twelve-month period under study. Two-thirds of the sample were working at this longest-held job at the time they returned their completed questionnaires last spring or summer. Among those not at this job when completing the questionnaire, 178 were working at different jobs. It is our impression that the remainder were not working because they were preparing for or in the midst of term examinations at the time they received the mail questionnaire.

TABLE 1.19

FIELD OF NONSTIPEND EMPLOYMENT AND COMPOSITE FIELD OF GRADUATE STUDY

Field of Nonstipend Employment	Per Cent Having Employment					
	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total, Five Fields
Physical science.	64	5	5	2	1	18
Engineering . . .	14	91	2	2	2	33
Health	1	*	9	2	1	2
Life science. . .	4	*	65	4	3	10
Education	8	*	12	4	34	9
Behavioral science	2	1	3	57	8	11
Humanities. . . .	2	1	1	6	30	6
Other	5	2	4	24	22	10
Total. . . .	100	100	101	101	101	99
N.	848	1,094	440	574	470	3,426
No employment	879	475	706	489	379	2,829
NA	110	56	67	111	116	460
Total N. . .	1,837	1,625	1,213	1,174	965	6,814

*Less than one-half of 1 per cent.

The few engineering students who worked in nonengineering fields had jobs in the physical science fields (5 per cent). Physical science students reciprocated by taking jobs in engineering (14 per cent) and another 8 per cent of them held positions that they classified as "education." The greatest concentration of life science students with nonstipend employment outside their fields of study occurred in education (12 per cent taught natural science subjects), and, not surprisingly, 9 per cent found employment in related health fields. When behavioral science students found employment outside of behavioral science fields, it was most frequently in business or commerce.[6]

The distribution of students in the humanities by field of employment during 1962-63 was at variance with the other composite fields. First, only a minority classified their jobs as in the humanities (30 per cent) while 34 per cent gave education as their field of employment.[7] Because the composite field of humanities in this survey is comprised of history and English, the bulk of these students probably secured teaching positions at the secondary level in these subjects. In sum, the five composite fields of study differed in the extent to which field of employment corresponded with field of study and in the pattern of employment by field when the job was secured in a different field.

Who were the employers of graduate students in these fields? Table 1.20 shows that the most frequently mentioned employer was a "private company": one out of three (35 per cent) worked for this type of employer and another one out of five secured nonstipend employment at the "college or university at which I am enrolled." Research organizations and the Federal government each employed another one out of ten graduate students, and 8 per cent held jobs in elementary or secondary schools or school systems. Table 1.20 shows that engineering students especially worked for private employers, the pattern among physical science students was close to the overall distribution, life science students with nonstipend employment were frequently in academic settings, the behavioral science pattern was more closely allied to that in the life sciences than to that in engineering or physical sciences, and humanities students were in three cases out of ten in secondary teaching. A more detailed inspection of this table shows close connections between the field of study and the context for nonstipend employment, just as there were links between field of study and other academic and employment characteristics.

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[6] Inspection of their allocation by detailed field (not shown) revealed that fully 13 per cent were in advertising, marketing, business administration, industrial relations, and the like. If combined, fully 24 per cent of the employed were in "business and other" fields of employment. The remainder were distributed widely among various fields of employment.

[7] Employment in the field of education is compatible, needless to say, with graduate study in history and English.

Because of their advanced level of educational attainment and life cycle position (the median age of the graduate students in this sample is 26.5 and a majority are married), it is clear that there are economic pressures that induce them to secure employment while in the midst of their formal programs of study. In addition, many have long-term career commitments that impel them to get practical experience in their anticipated career field while in graduate school. To learn something about the fit between their nonstipend employment and the expected career field, respondents were asked whether:

This is.....(circle one) The kind of job I wanted in my anticipated career field.

A job which is relevant to my anticipated career field but not the kind I want.

A job that has nothing to do with my anticipated career field.

As shown in Table 1.21, roughly four students out of ten among those with nonstipend employment had secured desirable jobs in their anticipated career fields, and an equal number had employment in their anticipated career fields although not the kind they preferred. For one student out of five, field of employment was entirely unrelated to his anticipated career field. This was true of 40 per cent of the students in the humanities but of only 6 per cent of those in engineering. Not only did nine out of ten engineering students hold career-relevant employment last year, but over one-half also found "the kind of job I want."

The experience in the physical and life sciences conformed to the overall pattern, but the employed behavioral science students were least likely (27 per cent) to have had a job of the kind they wanted in their

TABLE 1.20

NONSTIPEND EMPLOYER AND COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Field of Employment	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total, Five Fields
Self-employed . .	2	1	2	4	5	3
Private company .	39	59	13	19	17	35
Professional partnership . .	1	1	*	1	2	1
Research organization/institute.	14	12	11	8	3	10
College or university at which enrolled. . . .	17	17	32	20	17	19
Another college or university. . .	8	3	9	11	8	7
Junior college or technical institute . . .	1	1	1	1	2	1
Elementary or secondary school or school system	7	*	11	4	30	8
Hospital, clinic, church, welfare, or other nonprofit organization.	2	*	10	17	7	6
Federal government.	11	9	11	10	6	10
State or local government. . .	3	3	6	7	4	4
Other	3	2	3	9	6	4
Total. . . .	108[a]	108	109	111	107	108
N.	942	1,134	499	675	574	3,824
NA	895	491	714	499	391	2,990
Total N. . .	1,837	1,625	1,213	1,174	965	6,814

[a] Totals to more than 100 per cent due to multiple responses.

TABLE 1.21

TYPE OF JOB AND COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Type of Job	Engineering	Physical Science	Life Science	Humanities	Behavioral Science	Total, Five Fields
"The kind I want in my anticipated career field".	52	44	37	31	27	41
"Relevant to my anticipated career, but not the kind I want"	42	36	41	29	45	39
"Has nothing to do with my anticipated career"	6	20	21	40	28	20
Total. . . .	100	100	99	100	100	100
N.	1,120	923	485	560	669	3,757
NA, no employment	505	914	728	405	505	3,057
Total N. . .	1,625	1,837	1,213	965	1,174	6,814

long-term careers. However, they were far more likely than students in the humanities to have held employment relevant for their career fields even if it was not exactly what they wanted. Earlier we showed that engineering students were most likely to hold full-time regular employment. Now, it is evident that the engineering graduate students were most likely to have integrated work and careers. We will see that this employment pattern has implications for policy formation concerning stipend support for graduate education.

Aslo, consider the information provided by these students concerning their monthly earnings before taxes from the highest paid regular job of at least six months' duration. Whether or not they were employed at this highest paid regular full-time job at the time of the survey, composite field differences in the peak earnings of these graduate students are probably an important indicator of the field's capacity to induce students to commit their time to full-time study. The man who earned more than $10,000 annually is not too likely to enter full-time study with a fellowship providing $2,000 and tuition.

Table 1.22 shows that 16 per cent of the sample reported this type of employment and had peak earnings of less than $400 monthly before taxes. Almost one out of four (23 per cent) had peak monthly earnings of $400 to $599. Nearly three out of ten (28 per cent) were earning at least $600 monthly before taxes, resulting in a salary rate from their major employment of no less than $7,200 annually. Among the roughly three out of ten students in the sample who were at this level of earnings in their highest paid regular full-time employment, one-sixth were earning from $600 to $799 monthly, and some 11 per cent were paid from $800 to over $1,000 monthly. In fine, for a substantial minority of graduate students in the sciences, engineering, and two of the humanities, the salary profile describing full-time employment ever held of more than six months' duration hardly promotes the image of struggling, impoverished scholars living from hand to mouth.

Field differences in peak earnings were varied: 26 per cent of the engineering students attained peak earnings of $800 per month or more as did 12 per cent of the physical science students compared with 5 per cent in the behavioral sciences, 3 per cent in the humanities, and 3 per cent in the life sciences. The opposite was true in the rank ordering of the fields in the percentage earning under $400 monthly. Thus engineering stood head and shoulders above the other fields in the peak earnings of students who ever had stable, full-time employment.

In addition, there were indications that the engineering students were holding the jobs yielding peak earnings more frequently than were students in other fields. Table 1.23 shows that some 71 per cent of the engineering students ever having had regular full-time jobs of more than six months' duration were in those jobs and at their peak earnings while enrolled for graduate study at the time of the survey. About one-half (51 per cent) of the physical science students were similarly situated as were 45 per cent of those in the humanities, but only 35 per cent of those in the life and behavioral sciences. In toto, one-half of those graduate students reporting full-time regular employment in a job of more than six months' duration were enjoying their best job.

TABLE 1.22

MONTHLY INCOME FROM HIGHEST PAID REGULAR JOB AND COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Monthly Income	Engineering	Physical Science	Behavioral Science	Humanities	Life Science	Total, Five Fields
$800 or more. . .	26	12	5	3	3	11
$600-$799	30	20	12	9	9	17
$400-$599	13	22	23	30	28	23
Less than $400. .	8	14	21	23	21	16
Never held regular job . .	23	33	39	35	40	33
Total . . .	100	101	100	100	101	100
N.	1,387	1,307	1,112	933	1,067	5,806
NA, monthly income on job. . . .	230	530	62	32	146	1,008
Total N. . .	1,625	1,837	1,174	965	1,213	6,814

TABLE 1.23

FIELD OF HIGHEST PAID REGULAR FULL-TIME JOB AND COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent)

Highest Paid Regular Full-Time Job	Engineering	Physical Science	Humanities	Life Science	Behavioral Science	Total, Five Fields
Job now holding .	71	51	45	35	35	50
Current field, but different job	12	14	10	16	12	13
Not in current field	6	18	21	25	32	19
None of the above	11	17	25	24	21	19
Total. . . .	100	100	101	100	100	101
N.	1,089	883	620	656	686	3,934
NA, no job .	536	954	345	557	488	2,880
Total N. . .	1,625	1,837	965	1,213	1,174	6,814

A majority of American graduate students enrolled for study in the sciences, engineering, and the humanities reported some form of nonstipend employment during the academic year 1962-63, but the chances of doing so varied extensively by field of study. Among the engineering students so employed more than one-half worked at their jobs on a full-time regular basis, but this was least likely to occur among life and behavioral science students. Field of employment typically coincided with field of study. Employed engineering students were most likely to be at jobs relevant to their courses and yielding peak earnings.

Summary

This chapter presented some of the academic and employment characteristics of graduate students enrolled in graduate programs in five composite fields of study in spring, 1963. On the whole these students have experienced institutional mobility, continuity in fields of study, and relatively uninterrupted study in the transition from college to graduate school. The great majority were enrolled for course work in the term under study; about one-half the students reported working at least forty hours a week on academic pursuits. Almost one-half expected to receive their terminal degree by the end of 1964, and a great majority expected that this would be the doctorate. A little more than 10 per cent expected to receive the doctorate without first taking a master's degree. Students taking the B.A.-Ph.D. route reported longer hours of work, less delay in starting, and greater commitment to their field than the students taking a master's degree before the doctorate.

A majority of the students reported some nonstipend employment, but there were extensive differences in employment by field of study. Employment typically coincided with the field of study. Engineering students reported regular full-time work most frequently; life science students least often.

Whether students received stipends in the form of scholarships, fellowships, teaching assistantships, or research assistantships last year, whether field of study affected their chances of securing stipend support, and how stipend holding related to some of the employment and academic characteristics described above are topics to be considered in Chapter 2.

CHAPTER 2

STIPEND HOLDING IN AMERICAN GRADUATE SCHOOLS

Growing enrollment in higher education and expanding professional manpower needs in educational institutions and industrial enterprises have given rise to a number of questions about the character of financial support for graduate education, particularly in the sciences and engineering. The first question concerns the extent, types, and sources of stipend support currently available for graduate study. In his 1958 survey of traditional arts and science graduate fields, Davis (1962, Chapter 6) found that two-thirds of the students received some sort of stipend, that stipends were the most important source of income available to graduate students when measured in terms of total dollars, and that the distribution of stipends was primarily determined by state of training type of school, and division of study. Have any changes occurred in the intervening five years in the pattern of stipend support? Were talented students in the behavioral sciences and the humanities, for example, still far less likely to receive support than their counterparts in the natural sciences?

Another question concerns the students enrolled in engineering studies. How did they compare with students in other fields? A detailed financial picture was provided in Davis' 1958 survey for the arts and sciences, but engineering has not had similar coverage to date. Furthermore, it is uncertain whether the pattern of support would be different if foreign nationals were excluded from analysis of the data, because they comprise a substantial minority of students in some fields enrolled for graduate study in American schools.[1] The tabular materials to be presented in this chapter and the ones that follow are limited to American citizens attending graduate school in the spring term of 1963. Support for foreign students undertaking advanced academic study in American universities may be a topic deserving additional study, but the population in focus consists of the seventeen students out of every twenty in these five composite fields of study who are American citizens.

Extent of Stipend Holding

A majority of the American graduate students enrolled for advanced study in the five composite fields were recipients of some form of stipend support during the academic year 1962-63.[2] Sixty-six per cent held at least one stipend, but there were substantial differences in the extent of stipend holding depending on the composite field of study (Table 2.1). The life sciences ranked highest, with four out of five students receiving this form of support, followed by physical sciences (three out of four), behavioral sciences (two out of three), engineering (six out of ten), and the humanities (less than one out of two). Clearly, field of study was a critical determinant of stipend support. The mere fact that a student had elected to take graduate work in the life sciences and enrolled for study in this field almost guaranteed him some form of stipend support, while the student in history or English, by the same token, cut his chances in half by committing himself to either of these fields.

Students were not necessarily restricted to one stipend during the academic year: some 19 per cent of the sample held a second stipend during the twelve-month period and another 3 per cent were holding a third. Thus one out of four students in the physical sciences held a second stipend, as did one out of five in the life and behavioral science fields, but only one out of eight in engineering and one out of nine in the humanities.

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[1] Our data show that some 18 per cent of the students in the composite field of engineering in the spring of 1963 were foreign nationals, as were 17 per cent of those in the life sciences, 12 per cent in the physical sciences and 10 per cent in the behavioral sciences. In contrast, foreign nationals comprised only 3 per cent of the students in the two humanities fields of history and English.

[2] See Question 29 of the questionnaire in Appendix 4 for definitions and instructions to the respondent.

TABLE 2.1

STIPEND HOLDING IN FIVE COMPOSITE FIELDS OF GRADUATE STUDY
(Per Cent)

Field of Graduate Study	First Stipend	Second Stipend	Third Stipend	N
Life Science	80	20	4	1,004
Physical science. . .	74	24	5	1,614
Behavioral science. .	63	20	4	1,055
Engineering	61	16	3	1,325
Humanities.	46	11	2	931
Total, all fields	66	19	3	5,929

N	5,929
NA, stipend	7
Aliens.	878
Total N	6,814

Types of Stipends

The stipends available to students in higher education can be roughly divided into two groups: nonduty stipends are those requiring no services from the recipient; a nonduty stipend with a value equal to or less than the amount of a student's tuition and fees is defined as a scholarship, while a nonduty stipend of an amount covering tuition plus a cash grant is a fellowship. Duty stipends are chiefly teaching assistantships (TA) and research assistantships (RA). What types of stipends did the students in the five composite fields of study hold in 1962-63? When more than one stipend was obtained, what was the pattern of stipend holding?

Table 2.2 presents a number of findings in condensed form for the entire sample of students, i.e., all fields combined:[3]

1. Some 15 per cent of the sample received nonduty stipend in the form of scholarships equal to or less than tuition. One out of five students (21 per cent) had a nonduty stipend, a fellowship covering tuition plus a cash grant. Another one out of five (20 per cent) of the students received a duty stipend in the form of a research assistantship, and about the same proportion (22 per cent) held teaching assistantships.
2. Slightly under one-half (48 per cent) held single stipends of the following types: scholarships (9 per cent); fellowships (13 per cent); research assistantships (13 per cent); and teaching assistantships (13 per cent).
3. About 19 per cent of the sample were recipients of two or more stipends. The scholarship, the RA, and the TA were the most frequently held second stipends (each type was held by 5 per cent of the sample), while another 4 per cent had fellowships.
4. If the student held a second stipend, the chances were less than one-half that the second stipend would be of the same type as the first one: 19 per cent held a second, but only 7 per cent had second stipends that were of exactly the same type as the first. If, however, we contrast duty with nonduty stipends, then 11 per cent held second stipends that

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[3] The reader is cautioned that the discussion on the pattern of stipend holding refers to the sample of five composite fields. These students represent slightly less than one-half of the total graduate student population; accordingly these relationships do not indicate the prevailing pattern among all American graduate students.

were of the same type as the first, i.e., nearly two out of three second stipends were similar in type to the first one.

Specifically:

a) If the first (and, by definition, highest value) stipend was a scholarship, then the second also consisted of a scholarship and the remaining types of stipends were virtually absent;

b) When the first stipend was a fellowship, however, the second stipend was fairly evenly distributed among the four types;

c) If the RA was the first stipend, then the student was not at all likely to hold a fellowship and hardly ever held another RA or a TA or a scholarship; and

d) If the TA was the stipend with the highest value, then again the occasional second stipend was almost uniformly distributed among all four types.

Field Differences in Types of Stipends Held

Table 2.3 shows that there are substantial differences in the types of stipends students were likely to hold, depending on their composite field of study.

Scholarships--Close to one out of four engineering students held stipends covering all or part of their tuition bills. This form of support was less frequently available in the other fields of study: in each of them roughly one out of ten held scholarships.

Fellowships--The life sciences outstripped the other fields in gaining this form of stipend support: about three out of ten students received grant in excess of the entire tuition. Next in line were the behavioral sciences, where one out of four (24 per cent) held a fellowship during the year under study. Humanities ranked at the bottom in this form of stipend support, 13 per cent of the sample in this field receiving fellowships.

TABLE 2.2

TYPE OF FIRST STIPEND BY TYPE OF SECOND STIPEND HELD BY AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS OF STUDY

Type of First Stipend	Type of Second Stipend					Total, Five Fields	
	None	Scholarship	Fellowship	RA	TA	First	First and Second
Scholarship . . .	9	2	*	*	*	11	15
Fellowship . . .	13	1	2	1	2	19	21
RA	13	1	*	2	1	17	20
TA	13	1	1	2	1	18	22
Total, second stipend .	48[a]	5	4	5	5	66	
No stipend . . .						34	

N	5,929
NA, stipend holding	7
Aliens	878
Total N	6,814

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*Less than one-half of 1 per cent.

[a] Because of rounding errors, percentages do not always add to the figure shown in total. Totals are recalculated on basis of N's. This applies hereafter.

TABLE 2.3

COMPOSITE FIELD OF GRADUATE STUDY AND TYPE OF STIPEND HELD

(Per Cent Holding as Either First or Second Stipend)

Field	Type of Stipend				N	NA on First and/or Second	Total
	Scholarship	Fellowship	RA	TA			
Life science. . . .	9	29	31	23	975	29	1,004
Physical science. .	14	21	24	32	1,590	24	1,614
Behavioral science.	11	24	24	17	1,033	22	1,055
Engineering	24	17	17	13	1,299	26	1,325
Humanities.	13	13	4	21	909	22	931
Total.	15	21	20	22	5,806	123	5,929

N	5,929
NA, stipend holding.	7
Aliens	878
Total N	6,814

Research assistantships--As shown above, the life sciences ranked at the top in the proportion holding fellowships. This field also overshadowed the others in securing duty stipends entailing research duties. About one-fourth of the students in both the physical and behavioral sciences held RA's as did 17 per cent of the engineering students. This form of support rarely flowed into the humanities: here only 4 per cent held an RA.

Teaching assistantships--Physical science students held the most stipends requiring teaching duties, close to one in three (32 per cent) held a TA. Humanities students, for a change, received their "expected" share of these stipends on the basis of the total sample distribution (21 per cent), while only 17 per cent of the students in the behavioral sciences and 13 per cent in engineering held TA's in the academic year 1962-63.

Thus the dominant form of support varied by field, ranging from scholarships in engineering to TA's in the physical sciences and the humanities.[4] In sum, in the life sciences stipend support was likely to be fellowships and RA's. Engineers were underrepresented in holding every type of stipend save scholarships, as noted above. Behavioral science was low on scholarships and TA's but made up for this in fellowships and RA's. Humanities ranked relatively low on all forms of support except for TA's.

Sources of Stipend Support

Students were asked to identify not only the type of stipend secured, but also the granting agency. The precoded format included nine agencies or special agency programs within the United States Federal government and seven other non-Federal donors such as private foundations, industrial or business firms, state or local governments, the graduate school the student was attending, and the like. A category "the school

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[4] Table 2.4a contains more detailed information on types of first and second stipends held in each of the five fields.

TABLE 2.4

TYPE OF FIRST STIPEND BY TYPE OF SECOND STIPEND (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS OF STUDY)

Type of First Stipend	Type of Second Stipend: No Second Stipend	Scholarship	Fellowship	RA	TA	Total: First	First and Second
	a) Per Cent in Physical Science						
Scholarship . . .	7	1	-	*	*	9	14
Fellowship	11	1	2	1	3	19	21
RA	14	1	1	2	2	19	24
TA	18	2	2	3	2	27	32
Total, second stipend. . .	50	6	5	6	7	74	
No stipend . .	26						
NA on first and/or second . .						24	
N						1,590	
Total						1,614	
	b) Per Cent in Engineering						
Scholarship. . . .	17	3	-	*	*	21	24
Fellowship	11	1	1	2	2	16	17
RA	10	2	1	1	1	14	17
TA	8	1	*	1	1	10	13
Total, second stipend. . .	46	7	2	4	3	61	
No stipend . .	39						
NA on first and/or second . .						26	
N						1,299	
Total N						1,325	
	c) Per Cent in Life Science						
Scholarship. . . .	5	1	*	*	-	7	9
Fellowship	20	1	2	1	2	27	29
RA	22	1	1	2	2	28	31
TA	14	1	1	2	1	19	23
Total, second stipend. . .	61	4	5	5	5	80	
No stipend . .	80						
NA on first and/or second . .						29	
N						975	
Total N						1,004	

TABLE 2.4--Continued

Type of First Stipend	Type of Second Stipend					Total	
	No Second stipend	Scholar-ship	Fellow-ship	RA	TA	First	First and Second
	d) Per Cent in Behavioral Science						
Scholarship. . .	5	1	-	*	*	6	11
Fellowship . . .	16	1	2	2	1	22	24
RA	14	2	1	3	1	21	24
TA	9	1	1	2	1	15	17
Total, second stipend. .	44	5	3	7	4	63	
No stipend .	37						
	NA on first and/or second . .					22	
	N					1,033	
	Total N					1,055	
	e) Per Cent in Humanities						
Scholarship. . .	9	1	*	-	*	11	13
Fellowship . . .	8	1	1	-	2	12	13
RA	3	*	*	*	-	4	4
TA	15	1	1	*	2	20	21
Total, second stipend. .	36	4	2	1	3	46	
No stipend .	54						
	NA on first and/or second . .					22	
	N					909	
	Total N					931	

NOTE: Excluded from the above are the third stipends of triple stipend holders. These are distributed as follows: (N's are reported):

Composite Field of Graduate Study	Type of Third Stipend (Per Cent)				
	Scholarship	Fellowship	RA	TA	NA
Physical science . .	16	11	24	15	9
Engineering.	22	5	2	6	5
Life science	9	7	13	4	2
Behavioral science .	8	7	11	10	5
Humanities	5	5	5	2	4

N in five composite fields	5,929
NA, stipend holding . . .	7
Aliens.	878
Grand Total N	6,814

*Less than one-half of 1 per cent.

I am attending, but I do not know the primary source" was included because sometimes the university administers funds from another source that the recipient of the stipend is unable to identify.[5]

Source of First Stipend

A detailed breakdown of sources for the first stipend (i.e., the one with the highest value) by field and donor is presented in Table 2.5. Two-thirds of those holding stipends secured their support from a source other than the Federal government and the remainder held stipends that they knew to come from a Federal agency. While the current public debate on the role of the Federal government in higher education fosters the impression that stipends flow largely from Federal coffers, then data show that stipends for graduate training in these five composite fields more frequently come from a variety of non-Federal sources than from Federal agencies.[6]

The Federal government was prominently identified with providing graduate student support in some fields, but not in others. Close to one-half of the students in the life sciences (46 per cent) held first stipends that came from Federal agencies, as did about four out of ten (39 per cent) of those in the behavioral sciences, one out of three (37 per cent) in the physical sciences, three out of ten (29 per cent) in engineering, and only one out of ten in the humanities.

The most prominent source appears to be "the school I am attending"--more than one out of three (38 per cent) recipients in the sample

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[5] The reader will bear in mind that data presented here refer to the composite field only. Substantial differences in sources of support could occur at the detailed field level (see Appendix 3).

[6] The same point is made if the entire sample is substituted for the stipend recipients in calculating these percentages: nearly one out of four (23 per cent) of the sample held a first stipend from a Federal source; over four out of ten (43 per cent) received their first stipend from a non-Federal agency; the remainder received no support during the time period under study.

TABLE 2.5

SOURCE OF FIRST STIPEND AND COMPOSITE FIELD OF GRADUATE STUDY

(Per Cent of Stipend Holders)

Donor of Stipend	Composite Field of Graduate Study					
	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total, Five Fields
Atomic Energy Commission	7	3	1	-	-	3
Department of Defense	4	6	1	2	1	3
National Science Foundation	15	7	16	5	-	10
Veterans Administration (excluding G.I. Bill)	*	*	-	2	-	*
National Aeronautics and Space Administration	1	3	*	*	-	1
Office of Education						
National Defense Education Act	3	2	3	6	8	4
Other Office of Education	-	*	-	1	-	*
Public Health Service						
National Institutes of Health Fellowship Program	1	*	6	9	*	3
NIH Training Grant and Traineeship Program	1	1	14	7	-	4
Other public health service	1	1	3	4	-	2
Other Federal government	3	4	2	4	1	3
Total U. S. government	37[a]	29	46	39	10	34
Private foundation, philanthropic organizations, etc.	3	4	2	5	9	4
Industrial or business corporation or firm	10	32	2	2	1	11
Directly from the school I am now attending	40	27	32	39	62	38
The school I am attending, but I do not know the primary source	7	5	10	7	6	7
State or local government (U.S.)	3	2	6	6	10	5
Foreign government or other foreign source	*	-	-	-	-	*
Other	1	1	1	2	3	1
Total non-U.S. government	63	71	54	61	90	65
Total	100	98	99	101	101	99
N	1,184	801	790	661	424	3,860
NA, source	15	18	19	13	16	81
No stipend	415	506	195	381	491	1,988
Total	1,614	1,325	1,004	1,055	931	5,929

N	5,929
NA, stipend	7
Aliens	878
Total	6,815

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[a] Where percentages do not add to subtotals, the subtotals were calculated on the basis of N to eliminate rounding errors.

[*] Less than one-half of 1 per cent.

gave this as their donor, and another 7 per cent received a stipend through their schools from an unknown source. Putting the two together, we see that close to seven out of ten (68 per cent) of the humanities recipients were supported through their schools, as were close to one-half (47 per cent) of the stipend holders in the physical sciences; this was also the case for over four out of ten in each of the life and behavioral science fields and about one out of three in engineering.

Another striking finding consists of the following: one out of ten students secured stipends through "an industrial or business firm or corporation," and these stipends mostly flowed into engineering. About one-third of the recipients in this field held stipends from this source (probably their employers), as did one-tenth of those in the physical sciences. Support from this source was rare in other fields. Another 4 per cent of the first stipend holders in the sample secured their support from private foundations or philanthropic organizations and 5 per cent reported that state or local government agencies provided some form of assistance.

Among the Federal agencies, one of the two most frequently mentioned as the stipend source was the National Science Foundation (NSF): one in ten stipend holders got support from NSF in 1962-63. Fields varied considerably in their reliance on this agency for support: About 15 per cent in each of the physical and life science fields held stipends from NSF in contrast with 7 per cent of the recipients in engineering and 5 per cent of those in behavioral sciences.

The second major donor of stipends among the Federal agencies is the Public Health Service (PHS): 9 per cent of the holders of at least one stipend in the sample secured their stipends through one of the PHS programs. Specifically, 4 per cent mentioned a National Institutes of Health Training Grant and Traineeship Program, while another 3 per cent mention the NIH Fellowship Program. The life sciences, especially, relied on this source. Some 14 per cent in the life sciences mentioned the NIH Training Grant and Traineeship Program and 23 per cent mentioned its parent organization, PHS (including NIH). Twenty per cent of the behavioral sciences recipients indicated PHS as the donor of a stipend, with 9 per cent specifically mentioning a fellowship from NIH. A far smaller proportion of those in the physical sciences (3 per cent) secured support from PHS, as did 2 per cent of the stipend holders in engineering.

The Office of Education was mentioned by 4 per cent of the sample, mainly with reference to the National Defense Education Act (NDEA).[7] About 8 per cent in the humanities mentioned the NDEA. Indeed, the humanities' major patron in the Federal government consisted of this program administered by the Office of Education. An Office of Education stipend was also mentioned by 7 per cent of the behavioral sciences sample, 3 per cent in each of the physical and life sciences, and 2 per cent of the recipients in engineering.

Some 3 per cent of the sample identified the Department of Defense as their benefactor. Support from this source evidently was directed at the physical science field and engineering: some 4 per cent in the former and 6 per cent in the latter mentioned this source, and most are probably full-time career military officers or RA's on contracts secured from this agency. The Atomic Energy Commission (AEC) also provided stipend support for graduate study in the physical sciences and engineering: 7 per cent of the students in the physical sciences and 3 per cent of those in engineering were enrolled for graduate study through support with stipends from the AEC.

It was too early for stipend support for graduate education in the sciences and engineering in 1963 to be one of the benefits from the race to the moon that is being conducted under the auspices of the National Aeronautics and Space Administration (NASA). One recipient in one hundred secured a stipend for study last year from NASA. Among the engineering students, about 3 per cent held NASA stipends, as did 1 per cent of the physical science students.

While the Veterans Administration (VA) has been prominently identified with support for education since World War II, there are no stipends in these five composite fields currently coming from this agency. Since respondents were instructed to exclude the GI Bill from VA stipend giving, a number of the graduate students currently studying under the GI Bill may have circled "other Federal government." Nevertheless, only 3 per cent of the stipend holders mentioned this nonspecific Federal source. Support for graduate education in the five fields of study from the VA, with or without the GI Bill, has faded away.

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[7] The fields of study typically supported by the Office of Education programs are not included in this study. These include the languages, various fields of education, etc. The numbers of students supported by various Federal agencies is presented in U.S. Congress, House (1963, pp. 17-28).

First Stipend: Field, Source, and Type

Having sketched the pattern of stipend holding in the composite fields of study first according to the distribution of various types of stipends among the sample, and then by source of the first stipend held, we can ask the following questions: were the stipends in the physical sciences primarily fellowships from government agencies and TA's from universities, or were there different stipend arrangements in this and other fields of graduate study?

Inspection of the five panels in Table 2.6 reveals that the fields differed in the extent to which concentration of kinds--i.e., source types--of stipends prevailed. Both the humanities and the physical sciences, for example, showed a specific form of concentration among the stipend holders: in each over one-third of the recipients held TA's from the university in which they were enrolled. In the behavioral sciences the same kind of stipend arrangement was reported by one-fifth of the recipients.

Specifically, the kinds of stipends by fields were as follows:

a) Physical sciences

33 per cent	university TA
9 per cent	university RA
11 per cent	NSF fellowship
6 per cent	AEC research assistantship
6 per cent	scholarship from business/industry

Each of the remainder is less than 5 per cent by source type.

TABLE 2.6

SOURCE AND TYPE OF FIRST STIPEND (AMERICAN GRADUATE STUDENTS) IN EACH COMPOSITE FIELD OF GRADUATE STUDY

a) Per Cent of Physical Science Stipend Holders

Source of Stipend	Type of Stipend[a]			
	Scholarship	Fellowship	RA	TA
Atomic Energy Commission	*	*	6	*
Department of Defense	*	*	3	0[b]
National Science Foundation	1	11	33	0
Veterans Administration (excluding GI Bill)	0	*	0	0
National Aeronautics and Space Administration	*	*	*	0
Office of Education				
National Defense Education Act	*	3	0	*
Other Office of Education	0	0	0	0
Public Health Service				
National Institutes of Health Fellowship Program	*	*	*	0
NIH Training Grant and Traineeship Program	0	*	*	0
Other Public Health Service	*	*	*	*
Other Federal government	1	*	1	*
Private foundation, philanthropic organizations, etc.	*	2	1	*
Industrial or business corporation or firm	6	2	1	*
Directly from the school I am now attending	1	2	7	29
The school I am attending, but I do not know the primary source	*	*	2	4
State or local government (U.S.)	*	*	*	1
Foreign government or other foreign source	0	*	0	0
Other	*	*	*	*

N	1,184
NA	15
No stipend	415
Total N	1,614

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*Less than one-half of 1 per cent.

[a] Columns do not total 100 per cent because of large number of cells in which there is less than one-half of 1 per cent.

[b] 0 = no cases in cell.

(Table 2.6--continued)

TABLE 2.6--Continued

b) Per Cent of Engineering Stipend Holders

Source of Stipend	Type of Stipend[a]			
	Scholarship	Fellowship	RA	TA
Atomic Energy Commission	*	*	*	0[b]
Department of Defense	2	*	3	0
National Science Foundation	*	5	2	0
Veterans Administration (excluding GI Bill)	*	0	0	0
National Aeronautics and Space Administration	2	*	*	0
Office of Education				
National Defense Education Act	0	2	*	0
Other Office of Education	0	*	0	0
Public Health Service				
National Institutes for Health Fellowship Program	0	*	0	*
NIH Training Grant and Traineeship Program	0	*	*	0
Other Public Health Service	0	*	*	0
Other Federal government	1	*	2	0
Private foundation, philanthropic organizations, etc.	*	3	*	0
Industrial or business corporation or firm	22	8	2	*
Directly from the school I am now attending	3	2	8	14
The school I am attending, but I do not know the primary source	*	*	2	2
State or local government (U.S.)	1	*	*	*
Foreign government or other foreign source	0	0	0	0
Other	*	*	*	*

N	801
NA	18
No stipend	506
Total N	1,325

TABLE 2.6--Continued

c) Per Cent of Life Science Stipend Holders

Source of Stipend	Type of Stipend[a]			
	Scholarship	Fellowship	RA	TA
Atomic Energy Commission	0[b]	*	*	0
Department of Defense	*	*	0	0
National Science Foundation	*	10	4	*
Veterans Administration (excluding GI Bill)	0	0	0	0
National Aeronautics and Space Administration	0	0	*	0
Office of Education				
National Defense Education Act	0	2	*	0
Other Office of Education	0	0	0	0
Public Health Service				
National Institutes of Health Fellowship Program	*	4	1	0
NIH Training Grant and Traineeship Program	0	9	3	2
Other Public Health Service	0	*	2	*
Other Federal government	*	*	2	0
Private foundation, philanthropic organizations, etc.	0	*	*	*
Industrial or business corporation or firm	*	*	2	*
Directly from the school I am now attending	2	2	10	18
The school I am attending, but I do not know the primary source	*	1	6	3
State or local government (U.S.)	3	*	2	*
Foreign government or other foreign source	0	0	0	0
Other	0	0	*	*

N	790
NA	19
No stipend	195
Total N	1,004

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*Less than one-half of 1 per cent.

[a] Columns do not total 100 per cent because of large number of cells in which there is less than one-half of 1 per cent.

[b] 0 = no cases in cell.

(Table 2.6--continued)

TABLE 2.6--Continued

d) Per Cent of Behavioral Science Stipend Holders

Source of Stipend	Type of Stipend[a]			
	Scholarship	Fellowship	RA	TA
Atomic Energy Commission	0[b]	0	0	0
Department of Defense	*	*	1	0
National Science Foundation	0	3	2	0
Veterans Administration (excluding GI Bill)	*	*	1	*
National Aeronautics and Space Administration	0	0	*	0
Office of Education				
National Defense Education Act.	*	5	0	0
Other Office of Education	0	*	*	0
Public Health Service				
National Institutes of Health Fellowship Program. .	*	7	1	*
NIH Training Grant and Traineeship Program.	*	5	1	*
Other Public Health Service	0	1	2	0
Other Federal government.	*	*	3	0
Private foundation, philanthropic organizations, etc.	*	4	1	0
Industrial or business corporation or firm.	1	1	*	0
Directly from the school I am now attending	4	4	12	19
The school I am attending, but I do not know the primary source.	*	*	4	2
State or local government (U.S.).	1	1	2	1
Foreign government or other foreign source.	0	0	0	0
Other	1	*	1	*

N	661
NA	13
No stipend	381
Total N	1,055

TABLE 2.6--Continued

e) Per Cent of Humanities Stipend Holders

Source of Stipend	Type of Stipend[a]			
	Scholarship	Fellowship	TA	RA
Atomic Energy Commission	0[b]	0	0	0
Department of Defense	*	*	0	0
National Science Foundation	0	0	0	0
Veterans Administration (excluding GI Bill)	0	0	0	0
National Aeronautics and Space Administration	0	0	0	0
Office of Education				
National Defense Education Act	*	7	*	*
Other Office of Education	0	0	0	0
Public Health Service				
National Institutes of Health Fellowship Program	0	0	*	0
NIH Training Grant and Traineeship Program	0	0	0	0
Other Public Health Service	0	0	0	0
Other Federal government	*	*	*	0
Private foundation, philanthropic organizations, etc.	1	7	*	*
Industrial or business corporation or firm	*	*	0	0
Directly from the school I am now attending	11	7	6	37
The school I am attending, but I do not know the primary source	1	2	*	2
State or local government (U.S.)	7	2	0	*
Foreign government or other foreign source	0	0	0	0
Other	*	*	*	*

N	424
NA	16
No stipend	491
Total N	931
Total, all fields	5,929
NA, stipend holding	7
Aliens	878
Total N	6,814

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*Less than one-half of 1 per cent.

[a] Columns do not total 100 per cent because of large number of cells in which there is less than one-half of 1 per cent.

[b] 0 = no cases in cell.

b) Engineering:

22 per cent	scholarship from private business/industry
16 per cent	university TA
10 per cent	university RA
5 per cent	NSF fellowship
8 per cent	fellowship from business/industry
3 per cent	university scholarship
The remainder	are below 5 per cent by source-type

c) Life sciences:

21 per cent	university TA[8]
16 per cent	university RA
13 per cent	NIH fellowship or traineeship
10 per cent	NSF fellowship
4 per cent	NSF research assistantship
4 per cent	NIH research assitantship
The remainder	are scattered by source-type

d) Behavioral sciences:

16 per cent	university RA
21 per cent	university TA
12 per cent	NIH fellowship
4 per cent	university fellowship
4 per cent	university scholarship
4 per cent	fellowship from a private foundation, etc.
5 per cent	NDEA fellowship
The remainder	are scattered

e) Humanities:

39 per cent	university TA
12 per cent	university scholarship
9 per cent	university fellowship
6 per cent	university RA
7 per cent	scholarship from state or local government
7 per cent	NDEA fellowship
7 per cent	fellowship from a private foundation, etc.
The remainder	are dispersed; none comprises 5 per cent or more of this composite field

First and Second Stipends: Field, Source, and Type

Table 2.7a-e shows the kinds of stipends held by the sample of students in each of the five composite fields. In each panel of the table the four top-ranking source types found in that field for the first stipend

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[8] The percentages indicated for university sources are the combined "directly from school of attendance" and "from the school, but I don't know the source" categories.

TABLE 2.7

STIPENDS (SOURCE TYPE) HELD MOST FREQUENTLY BY AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS OF STUDY

(Per Cent Holding Stipends)

a) Physical Sciences

First Stipend	Second Stipend						Total	
	None	TA from School	Fellowship from NSF	RA from School	Scholarship from Industry	All Other	First	First and Second
TA from school . .	17	1	1	1	*	5	25	30
Fellowship from NSF.	5	1	1	*	-	1	9	10
RA from school . .	4	1	*	*	-	1	6	8
Scholarship from industry	4	-	-	-	*	*	4	4
All other. . . .	20	3	*	1	-	5	30	37
Total, second stipend. . . .	50	6	2	2	*	12	74	
No stipend	26							

N 1,590
NA 24
Total N 1,614

b) Engineering

	None	Scholarship from Industry	TA from School	RA from School	Fellowship from Industry	All Other	First	First and Second
Scholarship from industry	11	2	-	*	-	-	13	14
TA from school . .	7	-	*	*	-	1	10	12
RA from school . .	5	*	*	*	*	*	6	8
Fellowship from industry	4	*	*	*	*	1	5	5
All other. . . .	19	*	2	1	*	5	27	30
Total, second stipend. . . .	47	3	3	2	*	8	62	
No stipend . . .	39							

N 1,299
NA 26
Total N 1,325

---

*Less than one-half of 1 per cent.

(Table 2.7--Continued)

TABLE 2.7--Continued

c) Life Science

First Stipend	Second Stipend						Total	
	None	TA from School	RA from School	Fellowship from NIH	Fellowship from NSF	All Other	First	First and Second
TA from school. .	12	1	1	*	1	2	17	20
RA from school. .	11	*	*	-	-	1	13	15
Fellowship from NIH	8	1	*	*	-	1	11	12
Fellowship from NSF	6	1	*	-	1	1	8	9
All other . . .	23	2	1	*	*	5	32	37
Total, second stipend . . .	63	4	2	1	2	10	81	
No stipend . .	20							

N 975

NA 29

Total N 1,004

d) Behavioral Science

First Stipend	None	TA from School	RA from School	Fellowship from NIH	Fellowship from NDEA	All Other	First	First and Second
TA from school. .	8	1	1	-	*	3	14	16
RA from school. .	7	*	*	-	-	2	10	13
Fellowship from NIH	6	*	1	-	-	1	8	8
Fellowship from NDEA.	2	*	*	-	*	1	3	4
All other . . .	21	1	1	*	*	5	29	36
Total, second stipend . . .	45	3	4	*	*	11	64	
No stipend. . .	37							

N 1,033

NA 22

Total N 1,055

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*Less than one-half of 1 per cent.

TABLE 2.7--Continued

e) Humanities

First Stipend	Second Stipend						Total	
	None	TA from School	Scholarship from School	Fellowship from Foundation	Fellowship from School	All Other	First	First and Second
TA from school .	15	2	1	*	*	1	19	21
Scholarship from school	4	*	1	*	-	*	6	8
Fellowship from foundation . .	3	*	*	*	-	*	3	4
Fellowship from school	3	1	*	-	*	-	4	5
All other. . .	11	1	1	-	*	2	15	16
Total, second stipend. . .	37	4	3	*	1	3	47	
No stipend . .	54							

N	909
NA	22
Total N	931

Total, all fields	5,929
NA, stipend holding . .	7
Aliens	878
Total N	6,814

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*Less than one-half of 1 per cent.

were cross-tabulated by the same four source types for the second stipend of all multiple stipend holders. The data were percentaged across the entire sample while the previous table summarized the information for stipend holders only.

a) Physical sciences.--Three out of ten students in the physical sciences composite field held university TA's, one-fourth (25 per cent) as their first and 6 per cent as their second stipend. Some 17 per cent of the sample were single stipend holders who held TA's at the school they were attending during the twelve-month period under study in this survey. Another one out of ten secured fellowship support from NSF to pursue advanced studies in the physical sciences; 8 per cent held university RA's as their first or second stipends, and 4 per cent received scholarships from industry or business. Another one out of three students (37 per cent) in the sample of the physical science fields of study held a wide variety of stipends that provided support less frequently than these four when classified by source and type together.

b) Engineering.--In engineering still another pattern of support prevailed according to Table 2.7b. The stipend most frequently held either first or second, was a scholarship from an industrial firm or business: 14 per cent of the sample in this composite field of study secured this form of support during the academic year 1962-63. Another 12 per cent reported that a university TA provided support, 8 per cent held a university RA, and 5 per cent received fellowship support from business or industry. Three out of ten students held other forms of support that were less frequently reported than these top four.

c) Life sciences.--Table 2.7c shows that one out of five (20 per cent) of the students in the life sciences held university teaching assistantships as their first and/or second stipends. It shows, furthermore, that 17 per cent held this kind of stipend as their first (and most valuable) stipend, 12 per cent were single stipend holders, and 4 per cent of the sample held the university TA as second stipends.

Another 15 per cent received a university research assistantship as their first or second stipend, one out of ten (9 per cent) held a fellowship from NSF, and another one out of ten (12 per cent) had secured fellowships from NIH. Over one-third (37 per cent) of the sample held stipends of various kinds that ranked in frequency below these top four stipends classified jointly by source and type.

d) Behavioral sciences.--Table 2.7d shows that some 16 per cent of the sample in the behavioral sciences held university teaching assistantships as their first and/or second stipends; another 13 per cent of these students secured RA's at the schools they were attending. The university TA was held by 14 per cent of the sample as their first stipend (and the one with the highest value), while 8 per cent were single stipend holders with this kind of stipend. Less than one out of ten (8 per cent) held NIH fellowships as first or second stipends; the remainder secured stipends of various kinds that were held by fewer than one student out of twenty in behavioral science when the stipends were classified by source and type.

e) Humanities.--We have already shown that the humanities labored under a handicap when compared with science and engineering. When secured, support was provided primarily by the school in which the graduate student was enrolled: 21 per cent of the sample in this composite field held university TA's as their first or second stipends, and another 8 per cent had received scholarships from their universities. The one out of five students holding a university TA was accounted for as follows: 19 per cent had this kind of support as first stipends, 4 per cent as second, 2 per cent held two university TA's, and 15 per cent of the sample were single stipend holders with this form of support. The remaining source types were held in less than one out of twenty cases.

Cash Value of All Stipends

Sources and types of stipends aside, what was the cash value of all stipends secured during the 1962-63 academic year.[9] Table 2.8 shows that some four out of ten students in the life and physical sciences held stipends with a total cash value of at least $2,500 (physical sciences, 40 per cent; life sciences, 45 per cent). In the behavioral sciences, 31 per cent and in engineering 27 per cent of the students held stipends with cash values of $2,500 or more, while only 15 per cent of those in the

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[9] See Question 29-D for the item.

TABLE 2.8

CASH VALUE OF ALL STIPENDS HELD AND COMPOSITE FIELD OF GRADUATE STUDY (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Holding Stipends)

Composite Field of Study	Cash Value of All Stipends								Mean Value (Approximate)	N
	None	Less Than $999	$1,000-$1,499	$1,500-$2,499	$2,500-$2,999	$3,000-$4,999	$5,000-$7,999	$8,000 or More		
Life science. . . .	19	11	4	20	16	26	3	*	$2,700	996
Physical science .	25	11	4	19	12	26	2	*	$2,646	1,595
Behavioral science.	36	8	5	20	11	17	3	*	$2,350	1,042
Engineering	38	21	4	10	8	15	3	1	$2,200	1,300
Humanities.	53	12	3	17	6	9	*	0	$2,000	916
Total, all five fields .	33	13	4	17	11	19	2	*		5,849

NA	87
Total.	5,936
Aliens	878
Total N	6,814

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*Less than one-half of 1 per cent.

humanities did as well. The advantages accruing to the students in the life and physical sciences, when compared to the other fields included in this study, is shown again by computing the median cash value of the stipends held. In the life sciences the median cash value was $2,700; in the physical sciences it was $2,646. The median cash value in the behavioral sciences was somewhat lower, amounting to $2,350 and it was even lower in engineering--$2,200. Not only were students in the humanities fields of English and history least likely to have held stipends, but when they were received, their median cash value was also the lowest--about $2,000. Since tuition and fees were charged against the cash value of stipends, it is evident that stipends alone hardly bespeak affluence for most graduate students.[10]

Some Academic Correlates of Stipend Holding

Whether or not a graduate student managed to secure a stipend to assist him in his pursuit of a degree depended on several academic factors, of which field of study was only one, albeit a very important one. Presumably, other academic considerations entered into the picture as well. In this section we examine academic performance and academic progress in graduate study as factors shaping a student's chances of securing stipend support in the five composite fields of study.

Field, Academic Performance, and Stipend Holding

If the students' self-reported current grade point average (GPA) is taken as an indicator of the kind of performance that counts in these matters, then Table 2.9 shows that academic performance did indeed affect the distribution of stipends. Among the sample who reported a GPA for graduate courses completed at the time they returned their questionnaires, 74 per cent of those reporting A or A- also held stipends during the last academic year, as did two-thirds of those attaining a B+ average; on the other hand, this percentage declined to 57 among the students reporting a B average or lower in course work for which grades were received. When field of study is considered in examining this relationship, we see that achievement makes less difference in some fields and more in others. For example, life science students scoring B or less did almost as well as their colleagues who averaged A or A- (87 versus 75 per cent); this situation was found as well in engineering (although the absolute level of stipend holding for each GPA category was lower in engineering than in life sciences). Reading across the table, we see that GPA strongly affected the chances of stipend holding in both the behavioral sciences and the humanities (in each case there was a difference of some 25 percentage points in stipend holding between the high and low GPA categories).

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[10] Since one-half of these students were married, additional income was provided by working spouses. Other aspects of graduate student finances--sources, amounts, expenditure, etc.--are presented in Chapters 5 and 6.

TABLE 2.9

COMPOSITE FIELD OF GRADUATE STUDY, CUMULATIVE GRADUATE GRADE POINT AVERAGE, AND STIPEND HOLDING (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)
(Per Cent Holding Stipends)

Composite Field of Study	Grade Point Average			N
	A, or A-	B+	B or Less	
Life science. . . .	87 (365)	79 (342)	75 (291)	998
Physical science. .	82 (582)	77 (459)	64 (562)	1,603
Behavioral science.	73 (471)	62 (352)	47 (225)	1,048
Engineering	69 (530)	58 (396)	55 (397)	1,323
Humanities.	57 (393)	49 (281)	30 (252)	926
Total, all five fields. . . .	74 (2,341)	66 (1,830)	57 (1,727)	5,898

N	5,898
NA, GPA	31
NA, stipend	7
Aliens	878
Total N	6,814

Reading down the columns, the rank ordering of fields was quite stable in the percentage holding stipends in each GPA group: Life science was the highest, followed by physical sciences, behavioral sciences, engineering, and humanities. There was one slight variation at the lower end of the GPA scale: Engineers scoring B or less did as well as their fellow engineering students scoring B+; and engineers and behavioral science students switched ranks in the order of stipend holding in the bottom GPA group. Nevertheless, the conclusion is that academic performance only affected the chances of stipend holding in a secondary way. The outcome was that poor students in life sciences did better than the best students in behavioral sciences and engineering in securing a stipend; and they completely outstripped the best students in humanities in gaining access to this source of income if grades are an indication of student quality.

Field, Academic Progress, and Stipend Holding

The measure of academic progress to be employed in this analysis is the one constructed by Davis (1962) for his 1958 study. His "Index of Academic Stage" combined years of study and academic progress, thus locating the graduate student in his movement toward a graduate degree in a system that lacks the structural clarity found in high school and college. The index yields four stages of study:

Stage I:	Students having completed one academic year or less, regardless of degree sought or type of academic work.
Stage II:	Master's candidates who have completed one or more years of graduate work.
Stage III:	Ph.D. candidates who have completed one year or more of graduate study, but who are not working on their theses.
Stage IV:	Ph.D. candidates who have completed a year or more of graduate study and are working on their theses (Davis, 1962, p. 19).

Table 2.10 shows that stage importantly influenced chances of securing stipend support during the academic year 1962-63. Among students having completed one academic year or less (Stage I), some 60 per cent held stipends, the percentage steadily rising with each stage and culminating

in a rate of stipend holding of 86 per cent among the doctoral candidates working on their dissertation (Stage IV). That field of study was also an important determinant of stipend holding is shown by the fact that life science students consistently held stipends at rates higher than students in other fields, and that the rate for life science neophytes (Stage I) is about the same as the rate for the most advanced students of the behavioral sciences and the humanities.

TABLE 2.10

COMPOSITE FIELD OF GRADUATE STUDY, STAGE OF STUDY, AND STIPEND HOLDING (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Holding Stipend)

Composite Field of Study	Stage of Study				N
	I	II	III	IV	
Physical science. .	69 (548)	70 (339)	77 (185)	90 (404)	1,476
Life science. . . .	76 (328)	80 (252)	87 (69)	90 (266)	1,202
Engineering	60 (603)	51 (286)	74 (132)	85 (181)	888
Behavioral science.	58 (370)	58 (189)	80 (192)	74 (197)	948
Humanities.	37 (395)	42 (187)	75 (131)	79 (84)	797
Total, all five fields. . . .	60 (2,244)	61 (1,226)	78 (709)	86 (1,132)	5,311

N	5,311
NA, stage	618
NA, stipend	7
Aliens	878
Total N	6,814

Field, Stage, and GPA

Putting together the three variables of field of study, academic progress (measured by the Stage Index), and academic performance (given by the current GPA in graduate study), Table 2.11 shows that field remained

TABLE 2.11

COMPOSITE FIELD OF GRADUATE STUDY, GRADE POINT AVERAGE, STAGE OF STUDY, AND STIPEND HOLDING (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Holding Stipends)

Composite Field of Study	Grade Point Average	Stage of Study			
		I	II	III	IV
Life science	A, A-	79 (107)	91 (67)	88 (25)	91 (123)
	B+	74 (94)	75 (76)	91 (33)	87 (95)
	B or less	78 (106)	74 (81)	- [11][a]	94 (48)
Physical science . .	A, A-	78 (160)	79 (96)	84 (81)	89 (205)
	B+	73 (135)	70 (111)	75 (52)	91 (126)
	B or less	62 (219)	62 (132)	66 (50)	88 (67)
Engineering.	A, A-	65 (218)	60 (81)	72 (69)	87 (122)
	B+	56 (159)	49 (104)	72 (53)	82 (44)
	B or less	61 (188)	44 (101)	- [10]	- [15]
Behavioral science .	A, A-	69 (147)	68 (65)	81 (90)	80 (118)
	B+	57 (111)	57 (79)	81 (69)	62 (61)
	B or less	44 (97)	43 (44)	71 (32)	- [16]
Humanities	A, A-	44 (140)	51 (70)	82 (73)	82 (56)
	B+	43 (100)	43 (68)	69 (48)	73 (22)
	B or less	28 (111)	28 (46)	- [9]	- [5]

N	5,141
NA, grades.	170
NA, stage	589
NA, grades and stage. . . .	29
NA, stipend	7
Aliens	878
Total N	6,814

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[a] Indicates base is too small for percentaging.

the crucial determinant of levels of stipend holding, but that within each field there was a distinctive pattern of stipend holding accounted for by the remaining two academic variables.

In the life sciences, sheer "survival" to Stage IV almost automatically guaranteed the student some form of stipend support, and GPA mattered not at all. In fact, the bottom GPA group in Stage IV did slightly better than the very best group, but among beginning students there was not any difference.

The relationships in the physical science field between stage and GPA can be formulated as follows: with each downward step in talent, stage played an increasingly important role in securing stipend support; and with each successive stage of study, performance as measured by current GPA was increasingly less important in stipend holding. This same pattern was apparent in the life sciences and engineering. The usual relationship obtained when the influence of talent was assessed at each level of academic progress; advanced students invariably reported stipend support more frequently than those at early stages of the game at each level of academic performance.

On the whole, stage and GPA both made a difference in the behavioral sciences as well. But stage was more important at some points and less so at others. Thus the brightest students always secured more stipends than the poorer students at each stage; and students in Stages III and IV did better than those in Stages I and II.

The humanities, operating under conditions of relative scarcity, showed the sharpest differences among the five fields in rates of stipend holding when stage and GPA were jointly considered; over eight out of ten talented students in advanced stages of study held a stipend in contrast with nearly three out of ten of the poorest students in the first year of graduate study. Differences by stage were more important than differences by GPA, which was also the case in other fields.

In summary, there were distinctive field differences at each stage and GPA category. Thus eight out of ten (79 per cent) of the Stage I life science students who reported GPA's of A or A- in their graduate work held a stipend, while the humanities student with identical academic characteristics held a stipend in only four cases out of ten. In the main, the effects of stage and GPA within most fields were additive, with the academically superior students at advanced stages of study most likely and the beginning students of lesser ability least likely to have stipend support.

Type of First Stipend, by Field and Stage

It has been demonstrated that whether or not a graduate student held a stipend depended heavily on field and stage of study. In this section we show that type of stipend secured depended on these same factors. Table 2.12 shows that, across the board, students were less likely to have scholarships with values equal to or less than their tuition bills as they advanced through their academic studies; they were somewhat more likely to have fellowships paying their tuition bills and providing cash grants as their first stipends as they moved into Stage III; they were also more likely to have duty stipends entailing research during the final stages of advanced study. Interestingly, duty stipends entailing teaching increased from Stage I through Stage III, but dropped again in frequency among students in Stage IV.

Students in engineering were most likely to hold scholarships at Stage I (41 per cent); they also outstripped the other fields in holding scholarships at Stages II and III, but showed little difference from advanced students in humanities by the time they reached Stage IV. Some 19 per cent of those in physical sciences, 13 per cent in life sciences, and 17 per cent in behavioral sciences also held scholarships as beginning students, but this type of first stipend largely disappeared by the time these students reached advanced stages of study. Students in humanities were twice as likely as those in behavioral sciences to hold scholarships at every stage of study. Within each field, however, chances of holding this type of stipend were reduced substantially as students moved through the system.

The second type of nonduty stipend, the fellowship, was available most readily at the early stages of study to students in the life and behavioral sciences and the humanities: about three out of ten stipend holders in each of these fields, as compared with some two out of ten in engineering and the physical sciences, received fellowships. At Stage IV engineering stood abreast of the life and behavioral sciences: some four out of ten in these fields were fellowship holders compared with only three out of ten in physical sciences and humanities. Since the fellowship permits the student to meet his academic requirements unhampered by stipend duties which may or may not contribute to his graduate program, and since it provides a cash grant as well, students in this category were presumably provided with the best opportunity for rapid completion of the degree program.

Research assistantships were rare in the humanities: not many more than one student out of ten had this type of support at any stage. Again, both the life and behavioral sciences were more likely to hold RA's than their engineering and physical science counterparts in the very early stages of study. At Stage IV, however, about four out of ten stipend holders in engineering, physical science, and life science secured RA's in contrast to three out of ten stipend holders in the behavioral sciences. In both engineering and the physical sciences, there was a rise in this type of stipend holding when first-year students were compared with those working on doctoral dissertations.

The field and stage pattern in teaching assistantships was different: in each field save the humanities the proportion of stipend holders with TA's was lowest at Stage IV. In the life and behavioral sciences the relationship appeared to be curvilinear--TA's were relatively infrequent at Stage I, more frequent at Stages II and III, and they dropped again at the last stage of advanced study. In engineering, TA's were held more frequently in Stages I and III than in Stages II and IV. In the physical sciences, some four out of ten stipend holders held the TA at every stage but the last; only one out of four were TA's at the time they were working on dissertations for the doctorate. In the humanities, about one out of three were teaching assistants in the early stages of study, six out of ten at Stage III, and almost one out of two at Stage IV, if they had any form of stipend support.

TABLE 2.12

TYPE OF FIRST STIPEND, STAGE OF STUDY, AND COMPOSITE FIELD OF GRADUATE STUDY (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

Composite Field of Study	Stage of Study							
	a) Per cent of stipend holders holding scholarships				b) Per cent of stipend holders holding fellowships			
	I	II	III	IV	I	II	III	IV
Physical science. .	16	19	8	4	22	17	31	30
Engineering	41	38	32	11	20	20	42	44
Life science. . . .	13	10	5	2	26	31	40	42
Behavioral science.	12	33	8	5	36	18	33	45
Humanities.	29	27	14	14	33	20	20	36
	c) Per cent of stipend holders holding research assistantships				d) Per cent of stipend holders holding teaching assistantships			
Physical science. .	17	22	19	41	44	41	43	24
Engineering	19	24	16	38	19	18	21	7
Life science. . . .	35	29	30	40	25	31	25	16
Behavioral science.	32	20	32	32	20	30	26	18
Humanities.	9	12	5	6	28	42	61	44

e) Summary of Tables 2.12a-d: Type of first stipend and stage of study for all fields combined

Type of First Stipend	Per Cent of Stipend Holders			
	Stage of Study			
	I	II	III	IV
Scholarship	23	20	13	6
Fellowship.	26	23	31	38
Research assistantship. .	22	24	21	36
Teaching assistantship. .	29	32	36	20
Total	100	99	101	100

(Table 2.12--continued)

TABLE 2.12--Continued

Composite Field of Study	f) Numerical bases for percentages in Tables 2.12a-d			
	Stage of Study			
	I	II	III	IV
Physical science.	378	232	140	361
Engineering	351	143	95	152
Life science.	240	176	57	236
Behavioral science. . . .	211	106	150	142
Humanities.	141	77	95	64
All fields combined .	1,321	734	537	955

N	3,544
NA, type of stipend	81
NA, stage	313
No stipend.	1,988
NA, stipend	7
Aliens.	878
Total N	6,814

In summary, field-stage differences in types of stipends held are shown in the panel below, which indicates the most frequently mentioned stipend held at the first and the last stages of study in each of the fields.

Field	Stage I	Stage IV
Physical science	TA	RA
Engineering	Scholarship	Fellowship
Life science	RA	Fellowship
Behavioral science	Fellowship	Fellowship
Humanities	Fellowship	TA

Duties for First Stipend

Some 42 per cent of the sample held first stipends that entailed certain duties during the twelve-month period. What were these duties? Table 2.13 shows that 29 per cent of the recipients of duty stipends were leading discussion or laboratory sections; another 40 per cent were working "on research project directed by someone else"; 33 per cent instructed undergraduate sections; hardly anybody was required to "lead seminars"; and 17 per cent had "other duties."

TABLE 2.13

DUTIES OF FIRST STIPEND AND COMPOSITE FIELD OF GRADUATE STUDY (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent of Research and Teaching Assistants with Various Duties)

Duties of First Stipend	Composite Field of Graduate Study					Total, Five Fields[a]
	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	
Lead dicussions or laboratory sections. . .	34	26	38	18	22	29
Lead seminars .	1	*	1	1	1	1
Work on research directed by someone else.	34	52	50	50	8	40
Instruct undergraduates . .	35	25	24	29	61	33
Other	13	14	15	27	27	17
N	734	316	466	371	218	2,105

NA	76
Scholarships and fellowships .	1,760
No stipend	1,988
NA, stipend	7
Aliens	878
Total N	6,814

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*Less than one-half of 1 per cent.

[a] Percentages total more than 100 due to multiple responses.

Field differences in types of duties performed if the first (or only) stipend was an RA or TA are substantial. One-half of the engineers mentioned "research," as did one-half of the duty stipend holders in the life and behavioral sciences, but only one-third of the duty stipend holders in the physical sciences were required to work on a research project directed by somebody else. Since the core work in the humanities primarily entails solo effort, only 8 per cent of the graduate students holding duty stipends in history or English reported this type of "research" duty. On the other hand, over one-half (61 per cent) of the students holding duty stipends in the humanities were required to instruct undergraduate sections as compared with one-third of the physical science and behavioral science duty stipend holders and one-fourth of those in engineering and the life sciences. A related teaching function showed yet another distribution: about one-third of these students in the physical and life sciences and engineering were required to lead discussion or laboratory sections, as were one-fifth in the humanities and 18 per cent of the behavioral science students holding duty stipends. In summary, the division of graduate student labor depended heavily on field of study.

Family Role and Nonstipend Employment

Whether or not a graduate student received a stipend during the academic year 1962-63 was influenced by a variety of academic factors. These were, primarily, field of study, stage of study, and academic performance. However, there are nonacademic factors that should be considered in any evaluation of the pattern of stipend support for graduate study. Probably the most critical of these are the obligations of some 55 per cent of the sample who were married and the 66 per cent of the married who were parents. The variables of sex, marital status, and the presence of children were combined by Davis into a Family Role Index for his 1958 survey of graduate students' finances (1962, pp. 32-33). This Index was employed in Table 2.14 to show the extent of stipend holding in each field.

Bachelors and husbands were equally likely (over seven out of ten), but fathers somewhat less likely (61 per cent), to hold stipends.

Thus students with the greatest financial need held stipends less frequently than bachelors unencumbered by family burdens or husbands without children who may have had working wives. The financial returns from non-stipend employment presumably dissuaded fathers from applying for stipends. Female graduate students showed the same pattern albeit with rates of stipend holding below that among men of similar status. For example, 73 per cent of the bachelors were stipend recipients in comparison with 66 per cent of the single women.

TABLE 2.14

STIPEND HOLDING, FAMILY ROLE, AND COMPOSITE FIELD OF GRADUATE STUDY (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Holding Stipends)

Composite Field of Study	Family Role					
	Men			Women		
	Bachelor	Husband	Father	Single	Wife	Mother
Life science. .	85 (280)	85 (150)	75 (311)	84 (134)	83 (30)	79 (71)
Physical science . . .	82 (579)	78 (530)	65 (530)	72 (112)	77 (26)	43 (28)
Engineering . .	70 (389)	65 (248)	56 (668)	- [1][a]	- [2]	- [2]
Behavioral science . . .	71 (277)	69 (190)	59 (332)	71 (128)	50 (38)	45 (56)
Humanities . .	50 (258)	52 (108)	50 (185)	47 (198)	51 (63)	29 (85)
Total, all five fields. . . .	73 (1,783)	72 (1,016)	61 (2,026)	66 (573)	62 (159)	49 (242)

N	5,799
NA, family role	130
NA, stipend	7
Aliens	878
Total N	6,814

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[a] Indicates base is too small for percentaging.

Differences between fathers and the other male students in extent of stipend holding occurred in every field except the humanities, where family role made no difference at all. This was not the case among women, however; only one out of four mothers (29 per cent) undertaking study in the humanities held a stipend, in contrast with about one-half of those who were single or wives without children. Single women in the behavioral sciences were as likely to secure stipend support as were bachelors in this field, but wives and mothers were less likely than husbands and fathers to do so.

In the physical sciences bachelors and fathers fared better than single women and mothers, but wives without children received stipend support as frequently as did husbands. It was only in life sciences that women in every family role category held stipends as often as men. In summary, graduate students who were parents were somewhat less likely to receive stipend support than were other students enrolled for graduate work in 1962-63, although there were variations that reflect the overall availability of support in each individual field of study.

While it is impossible to unravel cause and effect in the relationship between nonstipend employment and stipend holding in a survey of this design, it is evident from Table 2.15 that the two variables were closely connected; close to nine out of ten (87 per cent) students reporting no employment during the past academic year held some kind of stipend, while two-thirds (67 per cent) of the students who held some form of nonstipend employment during the same period also had a stipend. The more striking finding concerns the students who held regular full-time employment (i.e., thirty-five hours or more per week for at least ten months during the year): their rate of stipend holding was only 32 per cent. Differences by field further accentuate the relationship: virtually everybody in the life sciences not reporting employment held a stipend (94 per cent); only one out of five students in the humanities and the behavioral sciences with full-time regular employment also reported stipends as a source of income that year.

TABLE 2.15

STIPEND HOLDING, NONSTIPEND EMPLOYMENT, AND COMPOSITE FIELD OF GRADUATE STUDY (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Holding Stipends)

Composite Field of Study	Employment		
		Employed	
	Not Employed	Less Than Regular Full Time	Regular Full Time
Life science	94 (546)	77 (320)	34 (138)
Physical science	93 (707)	74 (572)	36 (335)
Engineering	91 (294)	76 (435)	36 (590)
Behavioral science.	83 (415)	64 (453)	21 (187)
Humanities.	68 (358)	41 (370)	22 (203)
Total, all five fields.	87 (2,320)	67 (2,156)	32 (1,452)

N	5,929
NA, stipend	7
Aliens	878
Total N	6,814

Considering the sample as a whole, family role influenced the rate of stipend holding among women after the effects of full-time regular employment were removed from consideration, but this was not the case among male graduate students. Table 2.16 shows that eight out of ten men in each family role category not reporting regular, full employment that year held stipends; one out of three men--bachelors, husbands, and fathers alike--who had full-time regular employment also held stipends. In contrast, 76 per cent of the single women not involved in full-time regular employment held stipends, but only 52 per cent of the mothers did as well.

Even among the women with full-time regular employment, unmarried women did better than mothers in securing this form of support (30 per cent versus 18 per cent).

TABLE 2.16

STIPEND HOLDING, FAMILY ROLE, AND NONSTIPEND EMPLOYMENT

(Per Cent of American Graduate Students in Five Fields Holding Stipends)

Employment	Family Role					
	Men			Women		
	Bachelor	Husband	Father	Single	Wife	Mother
Regular full time	32 (232)	34 (199)	33 (837)	30 (122)	- [11][a]	18 (22)
Less than regular, including none.	80 (1,551)	81 (817)	81 (1,189)	76 (451)	64 (148)	52 (220)

N	5,799
NA, family role	130
NA, stipend.	7
Aliens	878
Total N	6,814

[a] Indicates base is too small to percentage.

Nor is this the entire story. Table 2.17 shows that although the likelihood of full-time regular employment was closely related to availability of stipends, family roles operated differently among men and women in determining this form of employment behavior. Thus among the men without stipend support one out of three bachelors held full-time regular employment in contrast with seven out of ten fathers. Even among the male stipend holders over one-fifth (22 per cent) of the fathers also had full-time regular employment; only one out of twenty bachelors (6 per cent) did likewise. In comparison, some 44 per cent of the single women without stipend support worked thirty-five hours a week or more for at least ten months, but marriage substantially reduced this mode of employment if stipend support was absent.

TABLE 2.17

STIPEND HOLDING, FAMILY ROLE, AND EMPLOYMENT
(Per Cent of American Graduate Students in Five Fields With Regular Full-Time Employment)

Stipend Holding	Family Role					
	Men			Women		
	Bachelor	Husband	Father	Single	Wife	Mother
Yes	6 (1,310)	9 (732)	22 (1,329)	10 (387)	4 (98)	3 (118)
No	33 (473)	46 (284)	72 (787)	44 (195)	11 (61)	15 (124)

N	5,799
NA, family role	130
NA, stipend	7
Aliens	878
Total N	6,814

In summary, stipend support and full-time regular employment typically operated as alternative arrangements for most students enrolled for graduate study; both were reported frequently, however, among male students who were fathers.

Stipend Holding: 1958 and 1963

In this last section, we deal with the question whether any changes took place in the extent of stipend holding in the fields for which information was gathered both in Davis' 1958 survey and again in the spring of 1963. Did any changes occur between these two points in the type of stipend support holders were able to secure?

The field classification employed in the present report closely resembles the earlier classification of graduate departments and divisions. Thus direct comparisons can be made for the behavioral sciences and the natural sciences (a combination of physical and life sciences), but Davis' coverage of the humanities was somewhat more comprehensive (our two fields of English and history comprise two-thirds of his humanities division). Since the engineering fields of study were not included in the first survey, our information provides a new baseline for measuring changes in this hitherto neglected field. The punched cards employed at NORC in the preparation of the 1958 study were retabulated, foreign nationals were excluded, and the humanities were limited to the two fields of English and history to insure comparability.

Table 2.18 shows that almost identical proportions of the students in the life sciences held stipends in 1958 and in 1963: some 77 per cent of these students in 1958 and 80 per cent in 1963 were recipients of some form of support for their graduate study. The rate of stipend holding in the behavioral sciences also showed very little change: 61 per cent in 1958 and 63 per cent five years later. Surprisingly, the rate of stipend holding in the physical sciences has declined slightly: 79 per cent formerly as against 74 per cent in 1963. It is possible that differences in study design and/or survey sampling variation account for this differential.[11] It _is_ safe to say that rate of stipend holding certainly did not shoot up in this field, despite the post-Sputnik rush to support education and research in the sciences. Finally, the two humanities fields registered a dip from the 1958 rate of 56 per cent to 46 per cent. It is clear that the two humanities fields--history and

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[11] One difference concerns the composition of the physical sciences group in the two surveys: comparison shows that mathematicians, for example, comprise 30 per cent of the present group but only 20 per cent of the 1958 group of physical science students. Furthermore, the rate of stipend holding among mathematicians was 73.3 per cent in 1958, while these students among the composite physical science group in 1963 reported stipend holding to the extent of 67.1 per cent. Variations such as these could deflate the rate in 1963 without signifying a genuine decline in the extent of stipend holding among physical science students during the five-year interval.

English--included for study in this survey have not derived any benefits in terms of increases in the rate of graduate student stipend holding.

TABLE 2.18

STIPEND HOLDING AT TWO POINTS IN TIME (AMERICAN GRADUATE STUDENTS IN SELECTED FIELDS)

(Per Cent Holding Stipends)

Field of Study	Date	
	1958	1963
Life science.	77 (287)	80 (1,004)
Physical science . . .	79 (804)	74 (1,614)
Behavioral science . .	61 (497)	63 (1,055)
Humanities	56 (524)	46 (931)

Statements concerning rates of stipend holding, of course, tell us nothing about the numbers of graduate students in the several composite fields who held stipends in 1958 and in 1963. In fact, more students were holding stipends in 1963 than in 1958, but these were fields of expanding enrollments. Hence the rate could remain stable or decline somewhat despite an absolute increase in the number of students who secure stipend support.

Furthermore, the types of stipends available to recipients shifted in each of the four composite fields for which comparisons were possible. As seen in Table 2.19, the type of change and the number of changes depended on field of study.[12] Arbitrarily assuming that a percentage difference of at least five points probably signified an increase or a decline (depending on the direction of change), then the behavioral sciences and the humanities showed the most extensive change in the character of stipend holding during the five-year interval, while the physical sciences were least affected. Our data suggest that even in the latter field, there has been an increase in the likelihood of holding an RA if support was received. On the other hand, stipend holders in the life sciences were more likely to have duty-free stipends in 1963 than in 1958 but were less likely to receive TA's as first or second stipends. Duty-free stipends declined somewhat in the behavioral sciences, and TA's declined substantially, but this was offset by the increasing likelihood of securing RA's. Each of the three shifts in rates in the two humanities fields was also substantial: while RA's increased, both duty-free stipends and TA's were less likely to be available to stipend holders in 1963 than in 1958.

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[12] The reader is cautioned that comparisons with the preceding table are not possible because the 1963 data on types of support secured by recipients of one or two stipends had to be adapted to the typology of stipends employed in the earlier study. For a description of the typology see Davis (1962, pp. 59, 199).

TABLE 2.19

TYPES OF STIPENDS HELD AT TWO POINTS IN TIME
(AMERICAN GRADUATE STUDENTS IN SELECTED FIELDS)

(Per Cent Holding Various Types as Either
First or Second Stipend)

Field of Study	Year	Type of Stipend			N
		Duty Free	Research Assistant	Teaching Assistant	
Physical science.	1958	37	20	43	635
	1963	35	26	39	1,065
Life science	1958	32	33	34	221
	1963	39	36	25	735
Behavioral science	1958	47	20	32	305
	1963	41	36	23	618
Humanities	1958	52	2	47	293
	1963	39	22	39	488

Summary

This chapter has described stipend support for graduate study in five composite fields. The extent of stipend holding as well as the sources, types, and total dollar values of all stipends held by graduate students were analyzed and compared among the composite fields of life sciences, physical sciences, behavioral sciences, engineering, and the two humanities fields of history and English.

Field of study was the most important determinant of stipend holding, although other variables also were involved. Extent of stipend holding varied from a low of 46 per cent in the humanities to a high of 80 per cent in the life sciences, with an average rate of 66 per cent across all fields of study. About one out of five graduate students also held a second stipend.

The dominant type of support varied by field: scholarships in engineering; fellowships and research assistantships in the life and behavioral sciences; research and teaching assistantships in the physical sciences; and teaching assistantships in the humanities.

Over all five fields, about two-thirds of all stipends came from sources other than the Federal government, the most prominent single source being the university the student attends. In the life, physical, and behavioral sciences, however, more than one-third of the stipends did come from the various Federal agencies.

The median value of stipends ranged from a low of $2,000 in the humanities to a high of $2,700 in the life sciences.

Various academic and personal characteristics of the students affected the proportion holding stipends: students with higher grades, students in advanced stages of study, students without families, and students without jobs all held stipends more often than their opposite numbers. Stipend holding and employment appear to be alternative modes of financing a graduate education.

Comparing stipend holding in 1958 and 1963 on the basis of an earlier NORC study revealed only slight changes. The life and behavioral sciences had slightly higher rates in 1963, the physical sciences and humanities slightly lower rates. In all but the life sciences duty-free stipends were relatively less frequent than they were in 1958.

One aspect of graduate education thus far deferred concerns the relationship of enrollment patterns and stipend support; this will be considered in the next chapter.

CHAPTER 3

ENROLLMENT FOR GRADUATE STUDY AND STIPEND SUPPORT

Part-Time and Full-Time Study Patterns of Enrollment

According to a report issued by the President's Science Advisory Committee, one of the barriers to graduate education in engineering, mathematics, and physical science has been the limited stipend support available to students seeking the doctorate:

> Faced with a choice between a starting salary above $7,000 and a very much smaller stipend with graduate study, many highly qualified college graduates in EMP, especially those with family responsibilities and those who incurred debts as undergraduates, decide they cannot afford to select graduate education. And many who do undertake it now must extend their study over extra years by combining part-time study with part-time jobs, deferring their availability for full-time professional employment.
>
> Stipends for graduate study must be of sufficient number and size to attract more students into advanced training, and to allow more of them to undertake full-time instead of part-time graduate study with a correspondingly shortened interval to obtain a Ph.D. (President's Scientific Advisory Committee, 1962, p. 8).

In this chapter we report on some findings that provide additional bench marks for evaluating this recommendation. How many students in the sample were enrolled for part-time study in the sciences and engineering? What was the pattern of employment among part-time students? What did part-time students say it would take in the way of financial support to enable them to convert to full-time study?

Measuring Part-Time Study

The structure of higher education at the graduate level lacks the coherence found at the lower strata of the educational system. Course requirements and the number of years of formal study vary from school to school; the number of courses a student holding a teaching assistantship may take varies by school; the proportions of research and formal course work vary from field to field as well as from school to school. Consequently, notions of what comprises full-time study are vague and difficult to transform into operational measures.[1]

Important policy questions have been raised concerning additional stipend support as a means for increasing the number of doctorate holders in certain scientific fields and in engineering. To meet the need for information bearing on this issue and to provide additional documentation for this aspect of graduate education, an attempt was made to identify students who were studying last spring on a "full-time" basis. An Enrollment Index was constructed employing the following items:[2]

1. Program of study, spring term, 1963

   Some 86 per cent of the students were enrolled in a program in which full-time study was possible. The remainder were enrolled in night school or some other program in which full-time study was impossible.

2. Course load, spring term, 1963

   Combining responses to two questions asking, "What is considered a full course load at your school and how many courses are you taking this term?"--33 per cent of the sample of American graduate students in the five fields said they were enrolled for a number of courses equal to or greater than that considered a full course load, while 67 per cent were enrolled for less than a full course complement at their schools.

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[1] Consider, for example, the definition of full-time/part-time employed in Office of Education surveys of enrollment for advanced degrees: "With respect to students enrolled for advanced degrees, a full-time [student] is one whose academic load--in terms of course work or other required activity (such as thesis)--is at least 75 per cent of that normally recommended for such students. Time spent by teaching fellows should be included only if such teaching is performed as a requirement for a degree. Employment which is not a part of the prescribed activity for an advanced degree should not be counted as part of the time spent on graduate work. A part-time student is one who is carrying an academic schedule lighter than that of a full-time student. (Note: the definitions in this paragraph are provided for guidance rather than rigid application.)" (Tolliver, 1963a, p. 478.) In the three Office of Education surveys for fall, 1960, 1962, and 1963, the proportion of students enrolled full time in all fields of study combined was about 40 per cent.

[2] These are items nos. 4, 6, and 7 of the questionnaire in Appendix 4.

3. Allocation of time for study, spring term, 1963

One-half of the students (50 per cent) gave an average of less than forty hours per week to study (including course work, thesis work, study time, etc.), and one-half averaged forty hours per week or more for study.

The three components of the index correlated as expected. According to Table 3.1a, some 37 per cent of the students who were enrolled in a program permitting full-time study were enrolled for courses that were equal to or greater in number than the full course load at their schools. In contrast, only 12 per cent of the students enrolled in night school or in a program that did not permit full-time study said that they were enrolled for a full course load. Table 3.1b shows that 59 per cent of the students enrolled in programs permitting full-time study were giving an average of forty hours or more to their academic activity, while 6 per cent of those enrolled in a night school, etc., were committing this amount of time to their study. The third panel of the table (3.1c) shows that, among students with a course load equal to or greater than a full course load at their schools, seven out of ten spent at least forty hours per week in study; among those with less than a full course load, however, only four out of ten averaged forty or more hours a week of study.

In constructing the Enrollment Index, each of the three variables was assigned a score as follows:

Variable	Score	
	1	0
Program of study	Permits full-time study	Night school or full-time study impossible
Course load	Equal to or greater than full course load at the school	Less than full course load at the school
Hours of study per week	Forty hours or more	Less than forty hours

TABLE 3.1

THE ENROLLMENT INDEX

(Type of Program and Course Load and Hours Studied Weekly)

Type of Program	a) Per Cent Reporting a Course Load Equal to or Greater than That Required by the School	b) Per Cent Studying 40 Hours or More a Week
Program permitting full-time study	37 (4,770)	59 (4,863)
Night school or program in which full-time study is impossible	12 (833)	6 (891)

N	5,603	N	5,754
NA, program	93	NA, program	108
NA, course load	214	NA, hours	63
NA, both	26	NA, both	11
Aliens	878	Aliens	878
Total N	6,814	Total N	6,814

c) Course Load and Hours Studied Per Week

Course Load	Per Cent Studying 40 or More Hours a Week
Course load is equal to or greater than that required by the school	70 (1,897)
Course load is less than that required by the school	41 (3,755)

N	5,652
NA, course load	210
NA, hours	44
NA, both	30
Aliens	878
Total N	6,814

TABLE 3.1--Continued

d) Construction of the Enrollment Index

I. Distribution of Cases and Scores[a]

Type of Program	Course Load	Hours of Study	
		40 or More a Week	Less Than 40 a Week
Permits full-time study	Equal to or greater than required	1,317 (3)	451 (2)
	Less than required	1,461 (2)	1,511 (1)
Full-time study not possible (night school, etc.)	Equal to or greater than required	1 (2)	103 (1)
	Less than required	43 (1)	675 (0)

N 5,562

Assignment of cases for which there was partial information:

	Score	N
Program permitting full-time study, 40 hours or more of study time	2	70
Program permitting full-time study, full course load or more	2	6
Night school, etc., more than 40 hours of study time . . .	1	5
Program permitting full-time study, less than 40 hours of study time	1	26
Night school, etc., less than 40 hours of study time . . .	0	64
Night school, etc., less than full course load	0	16
		187

II. Distribution of Scores

Score	N	Per Cent
3	1,317	23
2	1,989	35
1	1,688	29
0	755	13
	5,749	100

NA, type of program	90
NA, 2 out of 3 items	97
Total	5,936
Aliens	878
Total N	6,814

[a] Score is given in parentheses in each cell.

In each case, a score of zero indicated the likelihood of "part-time" enrollment. As shown in Table 3.1d, the Index has a range from 0 to 3, and each score included from 13 to 35 per cent of the cases. For the analyses reported here, full-time students are those who scored 2 or 3, while students scoring 0 or 1 are part time. When the Enrollment Index is used to classify the enrollment status in the spring of 1963 of American graduate students in the five composite fields, then 58 per cent were engaged in full-time study with the remainder studying part time.

Enrollment by Field

Substantial field differences in the percentage of students engaged in full-time study were found. Table 3.2 shows that life science students were the most likely to be studying full time (72 per cent), followed by 64 per cent of the students in the behavioral sciences and 61 per cent of those in the physical sciences. One-half (50 per cent) of the students in the humanities were full-time students as measured by the Enrollment Index, and only a minority (40 per cent) of the engineering graduate students were enrolled for full-time work. Enrollment statistics reported in the Office of Education survey are also given in the table.[3] Differences in definition notwithstanding, the distribution of students engaged in full-time study in the five composite fields showed close correspondence from one survey to another, with the exception of the behavioral sciences, where the difference in proportions of full-time students was nine percentage points.

Field, Enrollment, and Stipend Holding

Some 82 per cent of the graduate students in the five composite fields who were full-time students during the 1962-63 spring term received stipends, while only 47 per cent of those in part-time study did so. Field differences held up even when enrollment status was taken into consideration; nine out of ten full-time students in life sciences held a stipend in contrast with two out of three humanities students of similar enrollment status. About as many part-time students in the life sciences held stipends as did full-time students in the humanities (Table 3.3). The fields maintained their rank order in the percentage holding stipends, so that part-time students in the humanities were least likely to have this form of support (32 per cent).

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[3] Tolliver (1963b, Table 13, pp. 26-29). Relevant fields of study were reclassified according to the five composite fields employed in the present survey to ensure comparability.

TABLE 3.2

FULL-TIME ENROLLMENT FOR ADVANCED DEGREES (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS, 1960 AND 1963)

(Per Cent Enrolled Full Time)

Composite Field of Study	Survey	
	Office of Education Survey of Enrollment for Advanced Degrees, First Term 1962-1963[a]	NORC Survey of Graduate Student Finances
Life science	66	72 (972)
Engineering	40	40 (1,291)
Physical science . .	59	61 (1,561)
Behavioral science .	55	64 (1,037)
Humanities	48	50 (888)

N	5,749
NA, enrollment. .	187
Aliens.	878
Total N	6,814

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[a] Tolliver (1963b, Table 13, pp. 26-29).

TABLE 3.3

FIELD OF GRADUATE STUDY, ENROLLMENT STATUS, AND STIPEND HOLDING (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Holding Stipends)

Composite Field of Study	Enrollment	
	Full Time	Part Time
Life science	89 (695)	62 (277)
Physical science	88 (954)	54 (606)
Engineering	83 (519)	48 (770)
Behavioral science	77 (661)	42 (376)
Humanities	64 (447)	32 (440)
Total, five fields	82 (3,276)	47 (2,469)

N	5,745
NA, enrollment or stipend . . .	191
Aliens	878
Total N	6,814

Type of First Stipend

When full-time students held stipends, their first stipends were most likely to be fellowships (36 per cent). Close to three out of ten (29 per cent) of the stipend holders among the full-time students held research assistantships (RA's), another 27 per cent held teaching assistantships (TA's), and less than one out of ten (8 per cent) received stipends in the form of scholarships.[4] On the other hand, stipend holders among part-time students were most likely to be recipients of scholarships that covered part or all of their tuition but provided no cash grant for living expenses. Three out of ten were TA's, another two out of ten were RA's, and only 12 per cent held fellowships as their first stipends (Table 3.4).

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[4] Certain graduate schools do not permit students with RA's and TA's to enroll for full course loads. Such students would be classified as full time on the basis of the Enrollment Index only if they were at schools in which full-time study was possible and they were averaging at least forty hours a week on academic work (dissertations, language requirements, comprehensive exams, and the like).

TABLE 3.4

COMPOSITE FIELD OF STUDY, ENROLLMENT STATUS, AND TYPE OF FIRST STIPEND (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Holding Various Types of Stipends among Stipend Holders)

Composite Field of Study	Enrollment Status	Type of First Stipend				Total	N
		Scholarship	Fellowship	RA	TA		
Life science . . .	Full time	5	37	37	22	101	604
	Part time	19	22	29	31	101	170
Physical science .	Full time	4	31	30	36	101	833
	Part time	35	11	16	38	100	320
Engineering . . .	Full time	14	39	30	17	100	428
	Part time	58	11	16	15	100	357
Behavioral science	Full time	7	41	32	21	101	500
	Part time	23	13	32	32	100	154
Humanities	Full time	17	36	9	39	99	279
	Part time	36	8	7	48	99	135
Total, five fields	Full time	8	36	29	27	100	2,644
	Part time	38	12	19	30	99	1,136

N	3,780
No stipend or NA	2,156
Aliens	878
Total N	6,814

The highest percentage of scholarships among full-time stipend holders occurred in the humanities (17 per cent; this form of support went least frequently to the physical science stipend holders of similar enrollment status (4 per cent). Part-time students with scholarships were most frequently found among engineering stipend holders (58 per cent) and least frequently among those in life sciences (19 per cent). Field differences in fellowship support among full-time students with stipends were modest, ranging from a high of 41 per cent in the behavioral sciences to a low of 31 per cent in the physical sciences. Even 22 per cent of the life science stipend holders enrolled on a part-time basis, as opposed to 8 per cent of those in the humanities, held fellowships as their first stipends.

As for field differences involving duty stipends, the humanities were at the top or the bottom, depending on the type of stipend held. Both full-time and part-time stipend holders in the humanities were least likely of students in any of the fields to hold an RA (9 per cent and 7 per cent respectively), and they were most likely to be holding a TA (39 per cent and 48 per cent respectively). Some 37 per cent of the life science full-time students holding stipends were RA's; behavioral sciences had the highest proportion of part-time students performing research duties (32 per cent). Both full- and part-time students in engineering received TA's least frequently (32 per cent of the full-time and 15 per cent of the part-time students).

Source of First Stipend

Close to four out of ten full-time students with stipends secured their support from the Federal government, while only one out of four (23 per cent) part-time students had such support (Table 3.5). About 11 per cent of the full-time stipend holders identified their source as the National Science Foundation (NSF), and 12 per cent a Public Health Service (PHS) program or agency. Seven per cent of the part-time students mentioned NSF, and 4 per cent PHS.

Six out of ten stipend holders studying on a full-time basis identified a non-Federal source, the percentage increasing to 77 for the part-time stipend holders. Some 46 per cent of the former and 42 per cent of the latter identified their schools as the source (this included the recipients who were uncertain of the donor but knew that the school was administering the program).

TABLE 3.5

FIELD OF STUDY, ENROLLMENT, AND SOURCE OF FIRST STIPEND (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Receiving Stipends from Various Sources among Stipend Holders)

Composite Field of Study	Enrollment	Source of First Stipend									
		National Science Foundation	Public Health Service	All Other Federal Gov't	Total Federal Gov't	All School Sources	Business Firm or Corp.	Other	Total Non-Federal Gov't	Total	N
Life science .	Full time	15	25	8	48	41	2	9	52	100	604
	Part time	18	15	4	37	48	4	11	63	100	170
Physical science .	Full time	16	4	20	41	49	5	6	59	100	833
	Part time	14	2	12	27	43	22	8	73	100	320
Engineering . . .	Full time	11	4	23	38	40	14	8	62	100	428
	Part time	2	1	16	19	22	52	6	81	100	357
Behavioral science .	Full time	6	22	14	42	43	1	12	57	99	500
	Part time	1	10	13	23	55	5	16	77	100	154
Humanities . .	Full time	-	-	13	13	67	-	20	87	100	279
	Part time	-	1	4	4	68	3	25	96	100	135
Total, five fields . .	Full time	11	12	16	39	46	4	10	60	99	2,644
	Part time	7	4	11	23	42	24	11	77	100	1,136

N	3,780
NA, type	78
NA, enrollment	187
NA, stipend, not applicable . . .	1,891
Aliens	878
Total N	6,814

Major differences in source of non-Federal stipends were seen in business and industry: 4 per cent of the full-time students and 24 per cent of the part-time students received support from this source.

Some 48 per cent of the full-time and 37 per cent of the part-time life science stipend holders received Federal support. More than four out of ten full-time stipend holders in the physical and behavioral science fields also secured their stipends from a Federal source. Among full-time students in engineering, 38 per cent had Federal stipends, compared with only 13 per cent of the full-timers in the humanities.

Widespread field differences also obtain among part-time students. As mentioned above, life science ranked highest and humanities lowest (only 4 per cent in the latter field holding stipends received them from a Federal source). PHS supported one-quarter of the full-time stipend holders in the life sciences, 22 per cent in the behavioral sciences of similar enrollment status, and 15 per cent of the part-time students with stipends in the life sciences. NSF provided support to 15 per cent of the full-time and 18 per cent of the part-time stipend holders in the life sciences. NSF was also the source of 16 per cent of the first stipends held by full-time students with stipends in the physical sciences, and 14 per cent of the first stipends of part-time students in the same field. In engineering 11 per cent of those who were studying full time and 2 per cent of those part time with stipend support received their first stipends from NSF.

University support ranged from a high of 68 per cent among part-time stipend holders in the humanities to a low of 22 per cent among part-time stipend holders in engineering. Among the full-time students with university-administered stipends, humanities again ranked at the top--67 per cent, as compared with 40 per cent among engineering students. The bulk of business and industrial stipend support was channeled into engineering: fully 52 per cent of all part-time and 14 per cent of all full-time students with stipends in this field secured their assistance from this source. The remainder went to the physical sciences--5 per cent of the full-time students and 22 per cent of the part-time students in this field secured their stipends from business or industry.

Some Correlates of Enrollment Status

We have shown that two things account for much of the variation in stipend holding: field of study and enrollment status. Furthermore, in each field the types of stipends secured and the agencies providing the stipends were easily differentiated by introducing enrollment status as a control variable. In this section additional information is presented on some of the conditions that account for differences in enrollment status.

Field and Stage of Study

Table 3.6 shows that the proportion of full-time students in the sample increased with just about every successive advance in graduate study. Less than one-half of the students (49 per cent) in the sample who were in Stage I (having completed less than a year of graduate study) were enrolled full time, but among advanced students working for the doctorate and writing dissertations (Stage IV) over three out of four (78 per cent) were full time.

At the extremes, only 32 per cent of Stage I students in engineering were full time as compared to 83 per cent of the Stage IV students in the life and physical sciences. Within each field there was a steady increase in the proportion of full-time students, and the field differences at each stage steadily decreased with each successive advance in the program of the study. At Stage I, some thirty percentage points separated the highest field (life sciences) from the lowest field (engineering), but at Stage IV the percentage difference was reduced to fifteen points (life sciences--83 per cent full time; behavioral sciences--68 per cent full time). Field differences in full-time enrollment from Stage I to Stage IV were also considerable: percentage differences were slightest in behavioral sciences, where only seven percentage points separated Stage I from Stage IV in the proportion studying full time; in life sciences there was a 21 per cent difference; and so on. The most striking increase occurred in engineering: there was a more than twofold increase in the percentage engaged in full-time study from the first to the final stages of graduate study.

TABLE 3.6

STAGE OF STUDY, FIELD, AND ENROLLMENT STATUS (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)
(Per Cent Enrolled Full Time)

Composite Field of Study	Stage of Study			
	I	II	III	IV
Life science	62 (328)	72 (225)	74 (69)	83 (266)
Physical science . . .	53 (548)	53 (339)	59 (185)	83 (404)
Engineering	32 (604)	36 (286)	49 (132)	72 (181)
Behavioral science . .	61 (370)	65 (189)	70 (192)	68 (197)
Humanities	44 (396)	48 (187)	67 (131)	71 (84)
Total, five fields .	49 (2,246)	54 (1,226)	63 (709)	78 (1,132)

N	5,313
NA, enrollment	187
NA, stage of study . .	436
Aliens	878
Total N	6,814

Field and Current Grade Point Average

In addition to the increase in full-time enrollment as students progressed in their graduate study, as shown above, Table 3.7 indicates that students reporting a current grade point average (GPA) of A or A− were also more frequently enrolled as full-time students than those having course work graded below B+; 64 per cent of the top students and only 46 per cent of those performing at the B level or below were enrolled on a full-time basis in the 1963 spring term. This relationship was found in each of the five fields of study, but the trend was especially pronounced in the humanities, engineering, and the physical sciences. In the physical sciences, for example, 70 per cent of those with a current GPA of A or A−, but only 47 per cent of those scoring below B+, were full-time students. The relationship was weaker in the behavioral sciences and negligible in the life sciences. In the latter, for example, 73 per cent of those averaging A or A− were full time, but so too were 69 per cent of those averaging B or less. Engineering showed the lowest rate of full-time enrollment for A or A− students (50 per cent), and among engineers who averaged B or less, the rate of full-time enrollment dropped lowest of all (28 per cent). Thus the poorest students in the life sciences were much more likely to be enrolled for full-time study than the best students in the humanities and engineering.

TABLE 3.7

FIELD OF STUDY, GRADE POINT AVERAGE, AND ENROLLMENT STATUS (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Enrolled Full Time)

Field of Study	Grade Point Average					
	A, A−		B+		B or Less	
Life Science	73	(356)	73	(328)	69	(264)
Behavioral science	68	(464)	62	(345)	59	(207)
Physical science	70	(571)	65	(440)	47	(504)
Humanities	59	(374)	51	(271)	33	(192)
Engineering	50	(522)	38	(387)	28	(341)
Total, five fields . . .	64	(2,287)	58	(1,771)	46	(1,508)

N	5,566
NA, enrollment . . .	187
NA, GPA	183
Aliens	878
Total N	6,814

With the three academic variables--field of study, stage of study, and current GPA--put together, Table 3.8 shows that academic performance made a difference in the likelihood of full-time enrollment after field and stage of study were taken into account. The poorest advanced students in the sample were full time more frequently (65 per cent) than the best students in the early phases (55 per cent). Again, field differences were paramount: even the poorest life science students in early stages were full time more frequently (68 per cent) than the very best engineering students (40 per cent). The graduate student having all three "favorable" attributes (study in life sciences, advanced stage of study, and a high current GPA) was enrolled full time in eight cases out of ten; conversely, the beginning student in engineering with a low GPA was enrolled full time in only one case out of four.

Among students in advanced stages of study, field differences in full-time enrollment generated a spread of eighteen percentage points between the top and bottom ranking fields for students with a GPA of A or A−; among the B+ students, the spread increased to thirty-three points (separating engineering from life sciences), and the differences were of the order of thirteen percentage points among the poorest students in these fields at advanced stages of study. For the beginning students, on the other hand, the gap between fields steadily increased with each step down in academic performance, the spreads being twenty-two, thirty-five and forty-one percentage points respectively. In effect, the heavily supported fields had students in full-time enrollment at early stages of study even when these students were performing below the level attained by a majority of their peers.

Stipend Holding

In Table 3.8 well over one-half of the top (i.e., current GPA B+ or better) students in early stages of study in engineering and the humanities were enrolled for graduate study on a part-time basis. In physical sciences four out of ten of the students in the early stages (I and II) with top grades were part time as measured by the Index of Enrollment. If the nation's supply of manpower with doctorates in these fields is to be significantly increased in the near future, then it may

TABLE 3.8

FIELD OF STUDY, STAGE OF STUDY, CURRENT GRADE POINT AVERAGE, AND ENROLLMENT STATUS (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Enrolled Full Time)

Composite Field of Study	Stage of Study Index[a]					
	Beginning			Advanced		
	Current Grade Point Average					
	A, A-	B+	B or Less	A, A-	B+	B or Less
Life science . .	62 (176)	68 (170)	68 (187)	84 (148)	89 (118)	73 (59)
Behavioral science	66 (212)	60 (190)	60 (141)	73 (208)	64 (130)	67 (48)
Physical science	61 (256)	59 (246)	35 (351)	79 (286)	80 (178)	62 (117)
Humanities . . .	52 (210)	48 (169)	33 (157)	75 (129)	60 (70)	* (13)
Engineering . .	40 (299)	33 (264)	27 (289)	66 (191)	56 (97)	60 (25)
Total, five fields	55 (1,151)	52 (1,039)	44 (1,125)	76 (962)	70 (603)	65 (263)

N	5,143
NA, enrollment	187
NA, others (GPA=170; stage=436) .	606
Aliens	878
Total N	6,814

*Equals less than one-half of 1 per cent.

[a] Beginning = Stages I and II; advanced = Stages III and IV.

well be that stipends will enable many students in the above categories to engage in full-time graduate study. To test this notion, the data were re-analyzed with stipend holding introduced as an additional control variable. The results are presented in Table 3.9.

> The best predictor of full-time enrollment is whether a graduate student holds a stipend. Controlling for academic stage and GPA, rates of full-time study are at least twice as high for stipend holders as for others. Among stipend holders, stage of study and GPA both make a difference, with the former more influential. Among advanced students without stipend support, GPA makes a slight difference. No pattern was found among the beginning students in full-time enrollment.

The effects of stipend holding were maintained for every field, but there were some variations by field in the pattern of full-time enrollment:

> Life sciences.--Among the stipend holders, stage of study and current GPA still make a difference in full-time enrollment. Within each academic category, however, stipend holders are about twice as likely as their counterparts without stipends to be in full-time study. Among students in early stages of study, only stipend holding influences full-time enrollment. It is interesting to note that there were too few students in advanced study without stipends to make comparisons.

> Physical sciences.--The rate of full-time study was at least twice as high for stipend holders as for students without this form of support in every academic category. The pattern is similar to that found in the life sciences. As a result, the lowest GPA students in early stages of study with stipend support were more frequently (54 per cent) enrolled full time than the highest GPA, advanced stage students who lacked stipends (37 per cent).

TABLE 3.9

FIELD OF STUDY, STIPEND HOLDING, STAGE OF STUDY, CURRENT GRADE POINT AVERAGE, AND ENROLLMENT STATUS (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Enrolled Full Time)

Composite Field of Study	Stipend Holding	Stage of Study Index					
		Beginning			Advanced		
		Current Grade Point Average					
		A, A-	B+	B or Less	A, A-	B+	B or Less
Physical science . .	Yes	68 (201)	69 (177)	54 (220)	85 (251)	88 (147)	72 (92)
	No	29 (55)	33 (69)	23 (131)	37 (35)	29 (24)	28 (25)
Engineering.	Yes	53 (190)	44 (140)	39 (160)	74 (156)	65 (74)	64 (22)
	No	16 (109)	22 (123)	12 (129)	34 (35)	26 (23)	- [3][a]
Life science	Yes	68 (146)	78 (127)	76 (143)	87 (134)	86 (113)	75 (53)
	No	36 (28)	37 (43)	45 (44)	- [14]	- [15]	- [6]
Behavioral science . .	Yes	77 (145)	68 (108)	82 (62)	83 (167)	72 (94)	85 (34)
	No	42 (67)	48 (82)	42 (79)	34 (41)	42 (36)	- [14]
Humanities .	Yes	70 (97)	62 (72)	41 (44)	79 (106)	71 (49)	- [7]
	No	37 (113)	36 (96)	30 (113)	56 (23)	33 (21)	- [7]
Total, five fields . .	Yes	66 (779)	64 (624)	57 (629)	82 (814)	78 (484)	74 (208)
	No	31 (372)	34 (413)	27 (496)	40 (148)	36 (119)	31 (55)

N	5,141
NA, enrollment . .	187
NA, other	608
Aliens	878
Total N	6,814

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[a] Indicates base is too small to percentage.

Behavioral sciences.--Again, stipend holders attended graduate school on a full-time basis more frequently than the others in every stage and GPA classification, but, unlike the above two fields, there was no relationship between full-time attendance and stage or GPA.

Humanities.--Stipend holders in every category were much more likely to be full-time students. In the humanities, students with better grades attended full time more frequently than others; academic stage also made a difference, the more advanced students being more likely to be full-time attenders.

Engineering.--The rates of full-time enrollment were as sensitive to stipend holding in this field as they were in the other four composite fields of study. Both stage of study and GPA contributed to differences in full-time enrollment when the effects of stipends were taken into account, resulting in a range from a low of 12 per cent full time among B or B- beginning students, to a high of 74 per cent among A or A- students in advanced study.

These findings are useful in assessing the potential for moving part-time students into full-time graduate study provided that stipend support is available. If students with GPA's of A or A- currently studying part time comprise the reservoir of talent particularly requiring motivation for commitment to full-time study, then Table 3.9 suggests that increased stipend support is the answer. Indeed, increased stipend support should raise rates of full-time enrollment at all stages of graduate study. However, an infusion of stipends into these graduate fields of study may be limited in effectiveness; note that even among stipend holders in early stages of graduate study, rates of full-time enrollment range from a high of 78 per cent in the behavioral sciences to a low of 44 per cent in engineering. Does the lack of stipends account for the finding that only one in two stipend holders in this academic category of engineering students studied full time last spring? Perhaps nonacademic factors such as family role and the pattern of nonstipend employment should be considered as well.

Field and Family Role

Knowing that a majority of the sample was married, and that a substantial minority of the men and women enrolled for graduate study in the spring of 1963 had at least one child as well, there was good reason to expect that full-time study also depended on the family role of the graduate student. And it did. Table 3.10 shows that bachelors were most likely to be full time (68 per cent), followed by husbands (65 per cent), and then fathers (47 per cent). Single and married women, however, were enrolled full time to the same extent (over one-half in each case), but mothers were least likely of all to be studying full time at the time of the survey (only 31 per cent).

Consider, however, the field differences among the men: in each field fathers were less likely than bachelors or husbands to be enrolled full time, but fathers working for advanced degrees in the life sciences were more likely to be full-time students than bachelors in engineering. Field of study was important in shaping the chances of studying full time despite the overall relationship between family role and enrollment status. This held true for women as well as men. In each field mothers were less likely to be full time than other female students, but mothers in the life sciences were full time more frequently than single women in the humanities or physical sciences.

The influence of field is further noted when the following is considered: within each family role category, women were less likely to be full-time students than men in that field, but all the women in the life science fields were slightly more likely to be enrolled full time than were their male counterparts in the humanities or engineering.

TABLE 3.10

FIELD OF STUDY, FAMILY ROLE, AND ENROLLMENT STATUS (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Enrolled Full Time)

Composite Field of Study	Life Role					
	Men			Women		
	Bachelor	Husband	Father	Single	Wife	Mother
Life science . .	79 (275)	80 (146)	67 (297)	65 (130)	80 (30)	56 (68)
Behavioral science	71 (270)	73 (188)	57 (328)	71 (126)	60 (38)	28 (54)
Physical science	74 (565)	67 (308)	50 (513)	49 (107)	52 (23)	18 (28)
Humanities . . .	64 (245)	74 (105)	45 (181)	43 (185)	45 (62)	18 (78)
Engineering . .	52 (382)	43 (242)	32 (646)	- [1][a]	- [2]	- [2]
Total, five fields	68 (1,737)	65 (989)	47 (1,965)	56 (549)	57 (155)	31 (230)

N	5,625
NA, enrollment . . .	187
NA, life role	124
Aliens	878
Total N	6,814

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[a] Indicates base is too small to percentage.

Field and Nonstipend Employment

Having shown that full-time students received some form of stipend support nearly twice as frequently as part-time students, it is to be expected that enrollment status and the employment experience reported by the students would also be interdependent. According to Table 3.11, less than one-half (47 per cent) of the full-time students in the sample were employed, whereas close to four-fifths (78 per cent) of the part-time students took some form of nonstipend employment. Full-time life science students were least likely (35 per cent) to have been employed, while 62 per cent of the full-time engineering students reported some form of employment. Among the part-time students, the percentages ranged from 68 in the life sciences to 88 in engineering. While the range in percentage differences among part-time students in the high and low fields was somewhat reduced in comparison with differences occurring among full-time students, it was substantial nonetheless. Almost as many full-time students in engineering reported nonstipend employment as did part-time students in the life sciences.

Furthermore, level of enrollment for academic study was influenced by hours of work per week. The second panel of Table 3.11 shows the percentage employed on a full-time regular basis, i.e., thirty-five or more hours per week for ten or more months during the year. Only 5 per cent of the students enrolled for full-time study also maintained full-time regular employment; these highly energetic individuals were fairly evenly distributed by field of study. Among the students enrolled on a part-time basis, however, we see that some 50 per cent had full-time regular employment. This type of employment was especially prevalent among engineering students; 69 per cent were full-time workers most of the calendar year, as were close to one-half (47 per cent) of the part-time students in the physical sciences. In the life sciences, however, only three part-time students out of ten had full-time regular employment.

To summarize, stipend-holding made a substantial difference in the rates of full-time enrollment in the five composite fields of graduate study, but family roles and nonstipend employment--including work on a full-time basis throughout the year--also were important correlates of full-time attendance. Since the fields varied in the proportion of their graduate students in full-time regular employment, and also in the extent to which students were responsible for the economic welfare of spouses and children, we should assess the limits that extra-academic roles may impose on a policy of stipend support aimed at increasing the number of full-time graduate students in these fields of study.

TABLE 3.11

FIELD OF STUDY, ENROLLMENT STATUS, AND EMPLOYMENT (AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent in Employment Category)

Composite Field of Study	Enrollment Status	Employment: Any Type of Nonstipend Employment	Employment: Regular Full-Time Employment	N
Life science	Full time	35	5	695
	Part time	68	31	276
Physical science . .	Full time	43	3	954
	Part time	75	47	606
Humanities	Full time	47	3	447
	Part time	75	40	439
Behavioral science .	Full time	52	4	661
	Part time	75	41	376
Engineering	Full time	62	8	518
	Part time	88	69	769
Total, five fields	Full time	47	5	3,275
	Part time	78	50	2,466

N	5,741
NA, enrollment . . .	187
NA, employment . . .	8
Aliens	878
Total N	6,814

Readiness for Full-Time Study

Field of Study

To measure the availability of graduate students for full-time study, the questionnaire included the following item:

"What is the least it would take to get you into graduate studies full-time?"

Students classified as part-time on the basis of the Enrollment Index answered as follows:

	Per Cent
Tuition scholarship	1
Tuition scholarship plus $500 stipend with no obligations	1
Tuition scholarship plus $1,000 stipend with no obligations	4
Tuition scholarship plus $2,000 stipend with no obligations	14
Tuition scholarship plus $3,000 stipend with no obligations	14
Tuition scholarship plus $4,000 stipend with no obligations	22
None of the above	44

We see that over one-half (56 per cent) of the students classified as part-time attenders in spring, 1963, would enroll on a full-time basis provided that stipend support in the form of scholarships and cash grants of specific amounts were to become available to them. Tuition scholarships plus duty-free cash grants with a value of less than $2,000 would barely make a dent; only 6 per cent circled anything less than this sum. Some 14 per cent of these part-time students would study full time provided a $2,000 fellowship came their way; another 14 per cent could be recruited to full-time study provided the cash value of the stipend amounted to $3,000; and over one out of five (22 per cent) of those studying part time at the time of the survey would be enrolled full time if the cash grant amounted to $4,000. On the face of it, substantial numbers of part-time students expressed willingness to study full time if somebody was willing to offer support in the form of cash grants up to $4,000. Presumably, even more part-time students could be induced to study full time if the sum was set higher than $4,000.

There are important field differences, however, in the readiness to undertake full-time study under the conditions set forth (Table 3.12). Over one-half (52 per cent) of those in engineering would not consider full-time study even with stipends offering cash grants of $4,000, nor would 44 per cent of physical science students or 43 per cent of those in the behavioral sciences. Proportionately fewer students in humanities and life sciences indicated reluctance to engage in full-time study--36 per cent among the former and 31 per cent among the latter. Further, engineering students were the least inclined to study full time if the stipend amount was $2,000 or less (15 per cent), while part-time students in the humanities were most likely (29 per cent) to be so inclined.

TABLE 3.12

FIELD OF STUDY AND STIPEND REQUIREMENTS FOR FULL-TIME ENROLLMENT (PART-TIME AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Requiring Stipends in Various Amounts)

Composite Field of Study	Stipend Required for Full-Time Enrollment						
	Tuition Expenses and Cash Grant Amounting To . . .				None of the Above Would Get Me To Go Full Time	Total Per Cent	N
	Less than $2,000	$2,000	$3,000	$4,000			
Physical science . .	5	14	14	23	44	100	496
Engineering.	4	11	10	24	52	101	690
Life science	5	16	23	25	31	100	214
Behavioral science . .	7	18	13	19	43	100	308
Humanities .	14	15	16	20	36	101	377
Total, five fields . .	6	14	14	22	44	100	2,085

N	2,085
NA, amount	358
NA, enrollment	187
Full time: not applicable . .	3,306
Aliens	878
Total N	6,814

Field and Family Role

Family role was found to be the most important factor in addition to field of study in determining willingness of the part-time student to undertake full-time study if stipends with a cash value of up to $4,000 were made available. Table 3.13 shows that bachelors in the sample were most likely and fathers least likely to be ready to study full time with stipend support (see panel [f] of this table). Across the board, readiness for full-time study decreased with each step into the web of family involvement: among both men and women the percentage of students saying "none of the above" to a stipend of at least $4,000 for full-time study increased when bachelors were compared with spouses, and spouses were compared with parents. Thus 27 per cent of the single men but 54 per cent of the fathers were reluctant to study full time under the conditions of stipend support set by the questionnaire item. And 33 per cent of the single women as compared with 57 per cent of the mothers also indicated unwillingness to enter full-time study for their graduate degree even if this form of support were forthcoming.

Furthermore, the amount necessary to recruit these part-time students to full-time study depended on their family roles. Some 60 per cent of the bachelors would study full time if stipends with a value of less than $4,000 were offered, but only 16 per cent of the fathers in the sample would do so. Similarly, more single women than mothers would study full time under these conditions, and twice as many mothers as fathers would study full time if the lesser amount (i.e., under $4,000) were made available. In effect, both the amount of money needed for full-time study and willingness to undertake such study were determined to a large degree by the part-time graduate student's family role.

Substantial field differences persisted among student-fathers. The percentage of fathers in each of the fields saying "none of the above" to stipends with values of at least $4,000 ranged from a high of 62 per cent among those in engineering down to only 36 per cent among those in the humanities. This difference by field in the readiness of fathers in part-time study to consider full-time enrollment undoubtedly reflects the salary structure available in each of the fields for those who are employed on a full-time regular basis.

TABLE 3.13

FIELD OF STUDY, FAMILY ROLE, AND STIPEND REQUIREMENTS FOR FULL-TIME ENROLLMENT
(PART-TIME AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS)

(Per Cent Requiring Stipends in Various Amounts)

Composite Field of Study	Family Role		Stipend Required for Full-Time Enrollment				
			Tuition Expenses and Cash Grant Amounting To . . .		None of the Above Would Get Me To Go Full Time	Total Per Cent	N
			Less than $4,000	$4,000			
a) Engineering . .	Men:	Bachelor	52	15	33	100	160
		Husband	34	25	41	100	125
		Father	11	27	62	100	399
	Women:	Single	*	*	*	*	1
		Wife	0	0	0	0	0
		Mother	*	*	*	*	2
b) Physical science . . .	Men:	Bachelor	64	11	25	100	97
		Husband	37	23	41	101	89
		Father	16	31	53	100	228
	Women:	Single	46	11	43	100	46
		Wife	*	*	*	*	6
		Mother	18	23	59	100	22
c) Life science .	Men:	Bachelor	77	5	19	101	40
		Husband	66	17	17	100	21
		Father	18	39	43	100	85
	Women:	Single	69	13	18	100	42
		Wife	*	*	*	*	3
		Mother	*	*	*	*	16

TABLE 3.13--Continued

Composite Field of Study	Family Role		Stipend Required for Full-Time Enrollment				
			Tuition Expenses and Cash Grant Amounting To . . .		None of the Above Would Get Me To Go Full Time	Total Per Cent	N
			Less than $4,000	$4,000			
d) Behavioral science . . .	Men:	Bachelor	61	17	22	100	57
		Husband	52	15	33	100	39
		Father	20	28	52	100	118
	Women:	Single	52	18	30	100	34
		Wife	*	*	*	*	10
		Mother	27	3	70	100	36
e) Humanities . .	Men:	Bachelor	62	10	28	100	72
		Husband	54	14	32	100	22
		Father	30	34	36	100	91
	Women:	Single	45	21	35	101	92
		Wife	34	19	47	100	32
		Mother	42	9	49	100	55
f) Total, five fields	Men:	Bachelor	60	13	27	100	427
		Husband	41	21	38	100	292
		Father	16	30	54	100	925
	Women:	Single	50	17	33	100	212
		Wife	33	18	49	100	51
		Mother	33	10	57	100	131

N	2,038
Full time	3,306
NA, one or more items . . .	592
Aliens	878
Total N	6,814

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*Less than one-half of 1 per cent.

Panels (a) through (e) in Table 3.13 indicate that family role differentiated among those who would be available for full-time study in each of the five fields. Also, in each field the cost of full-time study steadily increased with each increment in family responsibility among the male students.

Reasons for Not Studying Full Time

Some 44 per cent of the students classified as part time on the basis of the Enrollment Index reported that they would not register for full-time study even if a stipend with a cash grant of $4,000 were offered to them (Table 3.12). An open-ended question solicited reasons for not going full time under these conditions.

On the face of it, reasons for not considering full-time study appear to reflect the circumstances of graduate student life: over one-fourth (28 per cent) explicitly mentioned family and economic obligations such as "I'm already in debt $6,000," "The payments on the house are too great," and the like. Another 15 per cent stated that $4,000 would not be sufficient to permit them to study on a full-time basis but did not pinpoint family or other economic responsibilities. Close to one out of five (19 per cent) indicated a preference for part-time study--"Prefer to take school at my own pace" or "I'm not in that much of a hurry"--signifying that they were exercising a choice for part-time study rather than being kept from full-time enrollment. About 14 per cent indicated that their work experiences were as important in training for their careers as the formal programs of study, and 5 per cent stated that aside from considerations of career training, a change to full-time study would entail the loss of tenure or seniority at the jobs they currently held (Table 3.14).

Again, the most useful variable in interpreting these reasons for not studying full time, even if stipend support of $4,000 were offered, is that of the graduate student's family role. According to Table 3.15, there was one pattern of reasons that characterized bachelors and another for fathers. Thus bachelors more than twice as frequently as fathers (26 per cent versus 11 per cent) mentioned the training value of their present employment for their long-run careers. In addition, bachelors were more than twice as likely as fathers (32 per cent versus 13 per cent) to express preferences for part-time study in terms of personal convenience, pace of study, etc. Conversely, 37 per cent of the fathers mentioned family or economic obligations and another 21 per cent said that $4,000 would not be sufficient to meet their current needs, while only one bachelor in twenty gave either of these reasons for not studying full time.

TABLE 3.14

REASONS FOR NOT ENROLLING FOR FULL-TIME STUDY UNDER ANY STIPEND CONDITIONS (PART-TIME AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS WHO WOULD NOT GO FULL TIME)

Reason	Per Cent
Employment	
Job is as important as school for career	14
Would lose tenure, security	5
Prefer job to school	11
Family or economic obligations	28
$4,000 and tuition expenses are not enough	15
Prefer to study part time	19
Will finish school work this year	6
Will finish school work soon	10
Will study full time in the future	2
Quitting school	1
Miscellaneous other	6

N	857
NA on reasons	57
NA, enrollment	187
Not applicable	4,835
Aliens	878
Total N	6,814

Note: Multiple responses were permitted.

TABLE 3.15

FAMILY ROLE AND REASONS FOR NOT ENROLLING FOR FULL-TIME STUDY (PART-TIME AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS WHO WOULD NOT GO FULL TIME)

(Per Cent Giving These Reasons)

Reasons	Family Role					
	Men			Women		
	Bachelor	Husband	Father	Single	Wife	Mother
Job						
Training and career	26	18	11	23	28	7
Tenure, security	5	4	5	11	0	3
Other	14	14	11	17	0	5
Family and economic obligations	4	14	37	3	12	48
$4,000 not enough	5	16	21	5	0	0
Prefer not going full time	32	16	13	22	32	38
All other	32	38	18	30	32	15
Total	118[a]	120	116	111	108	116
N	105	103	478	64	24	71

Total	845
NA, life role	55
NA, reasons	14
Inapplicable	4,835
NA, enrollment	187
Aliens	878
Total N	6,814

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[a] Multiple responses were permitted.

Similarly, mothers were less likely than single women or wives without children to mention the training value of their current employment, but mothers did mention their family and/or economic duties as precluding full-time study. While these relationships were similar to those found among the men when family role comparisons were examined, it is interesting to note that sex roles had opposite effects on the likelihood of viewing part-time study as a preference rather than a necessity: among men, bachelors most often could afford to "prefer" part-time study, but the single women were less likely than married women to think of part-time study as preferable.

Summary

An index of enrollment was constructed on the basis of which between 40 per cent and 72 per cent of the students, depending on field of study, were classified as full-time students.

Although field differences persisted, enrollment status was also an important correlate of stipend holding: fully 82 per cent of the full-time students held stipends while only 47 per cent of the part-time students did so. Full-time students were more likely to hold fellowships and to secure support from federal agencies than were part-time students.

Extent of full-time study varied with personal characteristics: advanced stage of study and top grades were conducive to full-time study. Men and students of both sexes without families were more likely than women or students with families to be full-time students. Students enrolled only part time were more likely to be employed than students enrolled full time.

A majority of the part-time students said that they could be induced, for a stipend of $4,000 or less with no obligations, to enroll full time. However, the more family obligations a student had the more money he wanted to enroll full time. Those students who said that a $4,000 stipend with no obligations would not induce them to enroll full time gave their families as a reason, or said that they needed more money.

CHAPTER 4

INSTITUTIONAL CORRELATES OF STIPEND HOLDING

Introduction

Because many questions about types of stipend support involve the schools students attend, this chapter considers the relationship between the characteristics of graduate schools and the stipend characteristics of graduate students. This chapter offers an analysis of the differences in rates of stipend holding and of the types, sources, and amounts of stipends held by students attending different types of graduate schools.

Our sample of American graduate students may not be used for this purpose without modification because this is a sample of students in thirty-seven selected fields, not a sample of students in graduate schools. To analyze institutional effects requires a sample of students in graduate schools. This latter group was derived by excluding from the sample of students in five composite fields of study those who were selected because they were enrolled in one of the fields with 100 per cent sampling, even though the school they were attending was not sampled for any other fields.[1] This refinement produced a sample of eighty-nine schools and 5,808 cases from among the sub-sample of 5,936 American graduate students who were enrolled for advanced degree programs in spring, 1963.

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[1] See Appendix 1 for a list of fields with 100 per cent sampling, and a detailed description of the rationale and procedures. Note that only students from the special fields on this list represent their schools; accordingly, they do not comprise a representative sample of students in any of the five composite fields of study in any of these schools. Therefore, they were excluded. For example, the University of California at La Jolla was sampled only because it enrolled students in oceanography (a 100 per cent sample field); no other students were sampled there. La Jolla was excluded from the school sample because oceanography students were not a representative sample of the physical sciences at this institution.

Three characteristics of graduate schools that might be expected to influence stipend characteristics of their students are: type of institutional control, quality, and size (Davis, 1962, Chap. 2): Some schools are privately controlled, others publicly; some are schools noted for excellence while others have less prestige; and, of course, some are large and some are small.

The public-private dimension in graduate schools may be an important variable, because each differs in sources of financial support. Thus students in each type of school might report different support patterns. Using the quality ranking of graduate schools constructed by Berelson (1960), one would look for different patterns of support at each level of institutional quality. Similarly, differences might be expected in the types and amounts of support in large and small graduate schools.

In this analysis we have classified the top twelve schools in Berelson's quality ranking as "high" or "Group I"; his second ten and the remaining schools in the Association of Graduate Schools--American Association of Universities groups as "medium " or "Group II," and all other schools as "Group III." Schools with total enrollments of less than 5,000 students were classified as small and those with more than 5,000 students as large. This figure was chosen because equal numbers of schools were above and below this size.

Table 4.1 shows how these institutional characteristics are related. It should be noted that there are more students and more schools in Group II than in Group I schools, and more of both in Group III than in Group II schools. Similarly, there are more public than private schools, and public schools are likely to be large while private schools are likely to be small. Although there are about equal numbers of small and large schools, the large schools enrolled 81 per cent of this sample of students.

Two observations seem appropriate at this point. First, we must remember that students in private, small, and high or medium quality schools are in a minority. When these characteristics are considered consecutively, each field consists primarily of students from the public, the large, and the Group III schools. This is shown in Table 4.2. Thus data shown without a "control" for institutional characteristics reflect the preponderance of

TABLE 4.1

RELATIONSHIP BETWEEN SCHOOL CHARACTERISTICS

Characteristic	Characteristic			
	School Quality			Total
	Group I	Group II	Group III	
a) Control				
Public	662[a] (5)[b]	1,072 (12)	1,720 (30)	3,454 (47)
Private	455 (7)	776 (12)	1,123 (23)	2,354 (42)
Total	1,117 (12)	1,848 (24)	2,843 (53)	5,808 (89)
	N = 5,808			

	School Quality			Total
	Group I	Group II	Group III	
b) Size				
Small	78 (5)	174 (11)	854 (32)	1,106 (48)
Large	1,034 (7)	1,674 (13)	1,989 (21)	4,702 (41)
Total	1,117 (12)	1,848 (24)	2,843 (53)	5,808 (89)
	N = 5,808			

	School Size		Total
	Small	Large	
c) Control			
Public	427 (19)	3,027 (28)	3,454 (47)
Private	679 (29)	1,675 (13)	2,354 (42)
Total	1,106 (48)	4,702 (41)	5,808 (89)
	N = 5,808		

[a] Number of students.

[b] Number of schools.

these students. Second, the relatively few students in this sub-sample in small schools of high and medium quality prohibits a simultaneous analysis of the effects of these two characteristics.

The analytic approach is to show the relationships between selected institutional characteristics and academic characteristics of students which we know to be important determinants of stipends, and then to examine the relationships between institutional characteristics and stipend variables.

Earlier analyses of the academic characteristics of students associated with stipend holding suggested that some of these characteristics might also be correlated with school characteristics. This is indeed the case: school quality was the institutional characteristic most highly associated with student academic characteristics previously discussed.

We begin by examining the relationship between school characteristics and student academic characteristics, such as stage of study enrollment status, and grade point average (GPA).

Academic Characteristics

In all fields of study, students in high quality graduate schools were more likely than students in other schools to be enrolled full time (Table 4.3). There is a direct relationship between quality of school and full-time enrollment: depending on field of study, students in high quality schools were enrolled full time more frequently than students in Group III schools. Physical and life science students in high quality schools had the highest levels of full-time enrollment, with eight out of ten students enrolled full time. Engineering students in Group III schools had the lowest rate, slightly over one-quarter of these students being enrolled full time.

In all fields of study except the life sciences, students in public institutions were more likely than students at schools in the private domain to attend full time. The differences in rates ranging from 3 to 17 per cent, were not as impressive as the differences in full-time study by school quality.

TABLE 4.2

FIELD OF STUDY AND SELECTED INSTITUTIONAL CHARACTERISTICS

(Per Cent)

Selected School Characteristics		Field of Study				
		Physical Science	Engineering	Life Science	Behavioral Science	Humanities
Control						
Public		59	44	79	64	58
Private		41	56	21	36	42
Total		100	100	100	100	100
Quality						
Group I		19	20	17	20	21
Group II		33	32	29	35	30
Group III		49	48	54	45	49
Size						
Small		23	19	22	11	18
Large		77	81	78	89	82
Control and quality						
Public	Group I .	12	9	13	12	12
	Group II .	20	15	21	21	15
	Group III	27	20	44	30	32
Private	Group I .	7	10	4	8	9
	Group II .	13	17	7	13	15
	Group III	21	28	10	15	18
Control and size						
Public	Small . .	8	3	16	5	8
	Large . .	51	41	63	59	51
Private	Small . .	15	16	6	6	11
	Large . .	26	40	15	30	31
N		1,595	1,308	947	1,049	909

N = 5,808

TABLE 4.3

COMPOSITE FIELD OF GRADUATE STUDY, SELECTED ACADEMIC CHARACTERISTICS, AND INSTITUTIONAL CHARACTERISTICS

Institutional Characteristics		Academic Characteristics				
		a) Stage of Study (Per Cent Stage IV)				
		Composite Field of Graduate Study				
		Physical Science	Engineering	Life Science	Behavioral Science	Humanities
Quality	Group I .	45 (275)	26 (234)	45 (154)	31 (198)	27 (172)
	Group II .	32 (490)	16 (390)	41 (237)	25 (325)	10 (231)
	Group III	18 (692)	10 (562)	19 (455)	13 (419)	4 (373)
Control	Public . .	29 (869)	16 (525)	28 (664)	18 (602)	10 (465)
	Private. .	26 (588)	15 (661)	37 (182)	25 (340)	22 (320)
Size	Small . .	25 (335)	19 (219)	16 (190)	29 (97)	7 (134)
	Large . .	28 (1,122)	14 (967)	34 (656)	20 (845)	21 (642)
Control and quality						
Public	Group I .	45 (175)	20 (110)	40 (115)	25 (119)	21 (94)
	Group II .	32 (304)	21 (180)	39 (176)	24 (202)	12 (119)
	Group III	19 (390)	10 (235)	19 (373)	11 (281)	4 (234)
Private	Group I .	45 (100)	32 (124)	59 (139)	39 (79)	3 (78)
	Group II .	32 (186)	12 (210)	48 (61)	27 (123)	8 (112)
	Group III	16 (302)	10 (327)	20 (82)	16 (138)	4 (130)

N	5,207
NA	601
Total N	5,808

TABLE 4.3--Continued

Institutional Characteristics		Academic Characteristics				
		b) Enrollment (Per Cent Full Time)				
		Composite Field of Graduate Study				
		Physical Science	Engineering	Life Science	Behavioral Science	Humanities
Quality	Group I .	80 (286)	64 (252)	80 (160)	78 (207)	71 (183)
	Group II .	69 (509)	47 (411)	77 (258)	69 (358)	57 (257)
	Group III	49 (746)	27 (610)	67 (504)	53 (466)	39 (425)
Control	Public . .	68 (912)	48 (560)	70 (725)	65 (656)	54 (513)
	Private .	51 (629)	35 (713)	77 (197)	62 (375)	47 (352)
Size	Small . .	55 (359)	39 (240)	76 (206)	60 (113)	42 (158)
	Large . .	63 (1,182)	41 (1,033)	71 (716)	64 (918)	53 (707)
Control and Quality						
Public	Group I .	79 (181)	61 (120)	77 (120)	75 (126)	70 (102)
	Group II .	71 (313)	59 (189)	77 (192)	69 (219)	64 (133)
	Group III	61 (418)	34 (251)	66 (413)	58 (311)	44 (278)
Private	Group I .	81 (105)	67 (132)	90 (40)	83 (81)	73 (81)
	Group II .	66 (196)	37 (222)	77 (66)	68 (139)	49 (124)
	Group III	33 (328)	23 (359)	71 (91)	45 (155)	31 (147)

N 5,632
NA 176
Total N . . . 5,808

Table 4.3--Continued

TABLE 4.3--Continued

Institutional Characteristics		Academic Characteristics				
		c) Grade Point Average (Per Cent A, A-)				
		Composite Field of Graduate Study				
		Physical Science	Engineering	Life Science	Behavioral Science	Humanities
Quality	Group I .	44 (293)	29 (250)	25 (157)	38 (207)	41 (187)
	Group II .	26 (511)	30 (411)	21 (263)	18 (358)	27 (265)
	Group III	19 (764)	17 (617)	9 (508)	12 (470)	19 (434)
Control	Public . .	27 (918)	22 (554)	14 (730)	18 (666)	24 (516)
	Private .	25 (650)	24 (724)	17 (198)	21 (364)	28 (370)
Size	Small . .	23 (364)	23 (244)	15 (206)	23 (111)	23 (159)
	Large . .	27 (1,204)	23 (1,034)	15 (722)	19 (924)	27 (727)
Control and Quality						
Public	Group I .	41 (181)	21 (118)	22 (118)	30 (128)	28 (105)
	Group II .	27 (310)	32 (185)	22 (196)	18 (222)	28 (133)
	Group III	21 (427)	15 (251)	9 (416)	14 (316)	21 (278)
Private	Group I .	48 (112)	36 (132)	33 (39)	51 (79)	55 (82)
	Group II .	25 (201)	27 (226)	19 (67)	17 (136)	26 (132)
	Group III	17 (337)	18 (366)	8 (92)	10 (154)	15 (156)

N 5,695
NA 113
Total N . . . 5,808

TABLE 4.4

COMPOSITE FIELD OF STUDY, CHARACTERISTICS OF GRADUATE SCHOOLS, AND NUMBER OF STIPENDS HELD

(Per Cent Holding Each Number of Stipends)

Field of Study	Number of Stipends	School Characteristics						
		Quality of Graduate School			Control of Graduate School		Size of Graduate School	
		Group I	Group II	Group III	Public	Private	Small	Large
Physical science	1	88	79	66	81	66	75	74
	2	33	29	19	27	22	25	25
	3	8	5	4	5	5	6	4
N		296	525	774	936	659	367	1,228
Engineering	1	76	67	54	64	61	61	63
	2	23	17	13	16	17	21	15
	3	4	3	3	3	4	3	3
N		257	418	633	573	735	248	1,060
Life science	1	92	87	76	82	82	84	62
	2	26	23	16	19	23	17	21
	3	5	5	3	2	8	5	3
N		163	270	514	744	203	210	737
Behavioral science	1	82	67	55	67	60	67	64
	2	30	23	13	21	17	26	19
	3	6	3	4	4	3	5	4
N		209	365	475	670	379	114	935
Humanities	1	62	54	38	47	48	43	49
	2	20	13	7	10	13	13	11
	3	5	2	1	2	3	1	3
N		192	270	447	531	378	167	742

N = 5,808

Even smaller differences were found controlling for size of graduate school; the largest differential was 11 per cent in the humanities. Generally, the larger graduate schools had slightly higher levels of full-time enrollment (except in the life sciences).

When school quality and school control were combined, a different picture emerged. The direct relationship between quality and rates of full-time enrollment was unchanged, but the pattern by school control was modified: Private, high quality schools were more likely to have students enrolled full time than were public high quality schools. Although the differences were not great, students who attended public schools of lesser quality were more likely than students who attended private schools of comparable quality to have been enrolled full time.

In all fields of study there was a direct relationship between school quality and the proportion of the students who had reached Stage IV (students enrolled for more than one year of school, working for a Ph.D. and on the thesis). Slightly over one out of four of the humanities students in high quality schools but less than one out of twenty of those in the Group III schools had reached this point. In the physical sciences, 45 per cent of the students in high quality schools and 18 per cent of the students in the Group III schools had reached this stage of study.

Neither school size nor school control made as large or as consistent a difference as institutional quality in the proportion reaching this level of academic progress. Students of the physical and life sciences and the humanities who studied at large schools were more likely than students in these fields at small schools to have reached this final stage of study. In engineering and the behavioral sciences, however, students in the small schools were more likely to have reached this level. Private school students in the life and behavioral sciences and the humanities were more likely to report advanced study than the public school students in the same fields, but the situation was reversed in the physical sciences and engineering.

When control and quality are combined, the direct relationship between quality and stage remained, but the relationship between stage and institutional control changed. In high quality, private schools, students were more likely to have reached Stage IV than students in comparable public schools. Differences were small and no patterns emerged among schools in Groups II and III.

Depending on field of study, high quality graduate schools had between 12 per cent (engineering) and 26 per cent (behavioral sciences) more students who had an A or an A- grade point average as undergraduates[2] than did Group III graduate schools.

While quality made an important difference in attracting students with higher undergraduate grades, other school characteristics did not. Combining control and quality, students in private, high quality schools had an undergraduate GPA of A or A- more frequently than did the students in public, high quality graduate schools. At other quality levels, however, there was a slight tendency for public graduate school students to report higher undergraduate GPA's than private graduate school students.

Thus students in high quality schools were more likely to be enrolled full time, to be in advanced study, and to have had higher undergraduate grades. Whether students in these schools also were more likely to hold stipends is considered below.

Stipend Characteristics

Keeping these student academic factors in mind, we now move to an analysis of the relationships between institutions and stipends.

The data show that certain institutional characteristics did influence the extent to which stipends are held by students. School quality was very important in this respect, type of control and size of the graduate school of lesser importance (Table 4.4).

Students in the higher quality schools were more likely to hold stipends than students in other schools. This was also true for multiple stipend holding: the higher the quality of the school the more likely graduate students were to report having held a second and even a third stipend. Although third stipends were rare in all fields, they were found most frequently among the physical and behavioral science students in high quality schools.

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[2] The undergraduate GPA is considered here; the preceding chapters used the graduate cumulative GPA.

TABLE 4.5

COMPOSITE FIELD OF STUDY, CONTROL AND QUALITY OF GRADUATE SCHOOL, AND NUMBER OF STIPENDS HELD

(Per Cent Holding Number of Stipends)

Field of Study	Number of Stipends	Control and Quality					
		Public			Private		
		Group I	Group II	Group III	Group I	Group II	Group III
Physical science	1	89	85	74	87	69	56
	2	35	29	22	30	28	15
	3	9	3	4	4	6	4
N		184	320	432	112	205	342
Engineering	1	69	71	56	82	64	52
	2	20	19	11	26	15	14
	3	6	3	1	2	4	4
N		121	190	262	136	228	371
Life science	1	93	87	76	90	85	76
	2	28	22	15	22	26	20
	3	2	3	2	15	10	3
N		122	201	421	41	69	93
Behavioral science	1	83	75	55	81	54	53
	2	32	25	15	26	20	11
	3	8	3	4	4	3	3
N		128	224	318	81	141	157
Humanities	1	60	55	39	65	53	36
	2	18	11	7	22	16	6
	3	3	4	1	8	1	1
N		107	137	287	85	133	160

N = 5,808

Earlier (see Chap. 2) we showed that stipend holding was highest (80 per cent) in the life sciences and lowest, (46 per cent) in the humanities. When school quality is also considered (in Table 4.4), 92 per cent of the life science students in high quality schools were holding stipends as compared with only 38 per cent of the humanities students in Group III schools.

In all five composite fields, more than six out of ten (62 per cent) students in the high quality schools held stipends; in four of the five fields, three-fourths or more of the students had at least one stipend, and one-fifth or more had two. Compared with the fields as a whole, students in high quality schools were well supplied with stipends.

Control and size of the graduate school made almost no difference in stipend holding. Only one difference appeared in the panel of the table distinguishing public and private schools: 81 per cent of the physical science students in public schools held a first stipend, as compared with 66 per cent in private schools. Also, only one difference by school size was worth noting: life science students in small schools held a first stipend more frequently than the students in large schools.

The joint effect of control and quality of the graduate school within field of study is shown in Table 4.5. The direct relationship between quality of graduate school and rate of stipend holding persisted with the following exceptions: A slight advantage accrued in the physical sciences among the students in public schools below Group I; in engineering among students in high quality private and medium quality public schools; and among behavioral science students in medium quality public schools.

In general, school quality made a difference in the extent to which students in these five composite fields held stipends, while control made a difference after taking quality into account. Thus students at high quality public schools usually reported the highest level of stipend holding; their counterparts at private schools in Group III were least likely to report any form of stipend support.

TABLE 4.6

COMPOSITE FIELD OF STUDY, CHARACTERISTICS OF GRADUATE SCHOOLS, AND TYPE OF FIRST STIPEND HELD

(Per Cent of Stipend Holders)

Field of Study	Type of First Stipend	School Characteristics						
		Control		Quality			Size	
		Public	Private	Group I	Group II	Group III	Small	Large
Physical science	Scholarship .	7	21	2	6	23	20	10
	Fellowship . .	24	27	35	25	20	25	25
	Research assistantship	27	24	35	27	20	25	26
	Teaching . . . assistantship .	42	27	28	42	37	30	39
Total		100	99	100	100	100	100	100
N		745	426	257	408	506	271	900
Engineering	Scholarship . .	18	45	17	31	45	45	31
	Fellowship . .	29	24	38	30	16	25	27
	Research assistantship .	31	17	28	25	20	14	25
	Teaching assistantship .	21	13	17	14	19	16	17
N		357	437	192	275	327	146	648
Life science	Scholarship . .	6	16	1	4	14	14	7
	Fellowship . .	28	48	37	35	29	47	28
	Research assistantship .	42	13	40	38	33	25	39
	Teaching assistantship .	23	23	22	23	24	14	26
N		593	163	146	231	379	171	585
Behavioral science	Scholarship . .	6	18	7	7	15	21	9
	Fellowship . .	29	45	47	38	23	33	35
	Research assistantship .	39	19	31	30	35	32	32
	Teaching assistantship .	26	18	15	25	27	14	24
N		444	217	169	239	253	75	586
Humanities	Scholarship . .	17	32	22	19	29	20	24
	Fellowship . .	20	35	34	25	22	35	25
	Research assistantship .	9	8	9	6	9	5	9
	Teaching assistantship .	54	25	35	50	40	40	42
N		245	172	113	144	160	68	349

N	3,799
NA	86
None . . .	1,923
Total N .	5,808

TABLE 4.7

COMPOSITE FIELD OF STUDY, CONTROL AND QUALITY OF GRADUATE SCHOOL, AND TYPE OF FIRST STIPEND HELD

(Per Cent of Stipend Holders)

Field of Study	Quality of School	School Control									
		Public					Private				
		Type of First Stipend				N	Type of First Stipend				N
		Scholarship	Fellowship	Assistantship			Scholarship	Fellowship	Assistantship		
				Research	Teach				Research	Teach	
Physical science	Group I	3	31	38	29	160	2	41	30	27	97
	Group II	4	23	29	44	268	9	29	25	37	140
	Group III	12	22	20	46	317	40	19	21	20	189
Engineering	Group I	11	41	30	18	81	22	36	26	16	111
	Group II	14	36	35	15	132	47	24	17	12	143
	Group III	27	17	29	27	144	59	16	12	13	183
Life science	Group I	0	25	50	25	110	6	75	11	8	36
	Group II	3	28	48	21	172	7	54	8	30	59
	Group III	11	30	36	24	311	29	28	18	25	68
Behavioral science	Group I	5	36	39	20	104	11	65	17	8	65
	Group II	4	31	38	28	167	15	54	12	18	72
	Group III	10	24	39	27	173	26	21	26	26	80
Humanities	Group I	15	13	15	57	60	30	58	2	9	53
	Group II	11	23	5	61	75	28	28	7	38	69
	Group III	24	22	7	47	110	40	22	14	24	50

N	3,799
No stipend . . .	1,923
NA, type	86
Total	5,808

Type of Stipends Held

We have shown (in Chap. 2) that the type of stipend held by graduate students depended heavily on field of study. Here, Table 4.6 indicates that the type of stipend obtained also depended on the quality of the graduate school. In all fields of study, students in Group I schools were less likely to hold scholarships than students in Group III schools and were more likely to hold fellowships.

Also, stipend recipients in physical and life sciences and engineering were more likely to hold research assistantships than their counterparts in other schools.

When the high quality schools provided stipend support to their students, they did so more frequently in a form that provided either a cash grant plus tuition or an opportunity to work on research. Other schools, in contrast, were more likely to provide tuition or less or to require students to assume some teaching chores in return for stipends. This difference in types of support available for graduate students may reflect the manpower needs of the various universities in the sample.

Generally speaking, the public school students in all fields of study were more likely than the private school students to have stipends that require duties. To put this as strongly as the data warrant, the most common stipend for a student in a public school was the assistanship, while the most common stipend for the private school student was the fellowship, except in engineering, a field providing scholarships. In engineering and the life and behavioral sciences almost one-half the stipend recipients in private schools held fellowships which gave them cash grants over and above their tuition bills. Only about one-third of the students in private schools, in all fields, held assistantships.

Small schools were more generous with scholarships than were large schools. In the four science and engineering composite fields of study, students in small schools more frequently held scholarships than students in large schools, while in the humanities the opposite pattern occurred. Fellowships were held with equal frequency by students in small and large schools except for students in the humanities and life sciences. In these two fields students were more likely to hold fellowships if they attended smaller schools. Students in large schools were more likely to hold assistantships than students in small schools.

Quality and control of the graduate school were combined with field of study to further specify type of first stipend held. In four of the five fields students in Group I private schools held fellowships more frequently than students in Group I public schools, and students in Group III public schools held teaching assistantships more frequently than students in Group III private schools. These relationships are shown in the following panel:

Field of Study	Percentage Differences In	
	Fellowships: Private Group I Minus Public Group I	Teaching Assistantships: Public Group III Minus Private Group III
Physical science	+10	+26
Engineering	- 5	+14
Life science	+50	- 1
Behavioral science	+27	+ 1
Humanities	+45	+23

The effects of control and quality of graduate school are clearly additive: fellowships were more common in the Group I private schools, and teaching assistantships were more common in Group III public schools.

If, for example, graduate schools utilize students according to their manpower needs, differences in stipend holding may also indicate different approaches to graduate training. The current debate on the character of graduate education has centered on the question of the purpose and nature of the training of graduate students. Should they be prepared to be college teachers or should they be taught to do research?

Data on the kinds of stipends provided by different types of institutions (see Table 4.7) shed some light, albeit indirectly, on this question. The way support is provided to students by graduate schools may reflect the aspect of the graduate program that these institutions consider to be important. When support is given primarily in a form requiring research activity, the emphasis is on training students to do research; when support requires teaching activity the emphasis is on training students to teach. The freedom to study and concentrate afforded by nonduty stipends may allow one to learn either research or teaching techniques, but when either teaching or research is required of the student, he must be getting training in one of these two aspects of his field.

If teaching assistantships are prevalent we infer that there is an emphasis on the teaching aspect of graduate training; if research assistantships are more prevalent there is an emphasis on research techniques and procedures.[3] When nonduty stipends are given, we cannot say that either of these aspects of graduate training is emphasized.

In Chapter 2 sources of support were shown to vary from field to field. Despite the popular impression that most graduate stipends flow from the Federal coffers, only one graduate student out of three reported a stipend from a Federal source. Consider the relationship between institutional characteristics and stipend sources: Whether the graduate school was public or private made little difference in sources of stipend support (Table 4.8). Only in the life sciences did we find a public-private difference in rates of Federal support of 10 per cent or more. Students attending private schools were more likely to report holding NIH traineeships and fellowships than students attending public schools. Other than this differential, there was no evidence that Federal stipends were given more often to students attending public or private schools.[4]

The proportion of students receiving stipends from non-Federal sources varied by school control. In all fields public school students reported holding stipends coming directly from the university more frequently than private school students. These advantages in support from the university were offset for students in private schools and in physical science and engineering by relatively more support from business and industry. Many students in these two fields were supported by their employers while attending school. Except in the humanities, levels of Federal support ranged between 38 and 49 per cent among students in high quality schools and between 28 and 42 per cent among students in other schools. In the humanities the level of support was much lower. Students in physical and life sciences were more likely to receive Federal support.

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[3] To be sure, student support is only partly determined by an institution's policy. Fellowships may be granted to students who then choose to attend an institution.

[4] Nor was there evidence here that students with Federal stipends were more likely to attend public rather than private institutions.

Among physical science students attending schools of high quality this advantage comes from the support secured from the Atomic Energy Commission and the National Science Foundation. In engineering, less pronounced advantages from a variety of Federal sources were evident. Engineering and behavioral science students in top quality schools reported similar likelihood of Federal stipends, although there were differences in individual Federal agencies. Humanities students in other schools were more likely than students in high quality schools to report holding stipends from Federal agencies--primarily via the National Defense Education Act.

In the physical sciences students in the schools below Group I reported holding stipends directly from their school more frequently than students in the high quality schools. In engineering the opposite was true. In the behavioral sciences and humanities, foundation support was reported by students in high quality schools more frequently than it was by students in other schools. In the life sciences, students in Group III schools reported holding stipends from state governments more frequently than students in other schools.

Information concerning sources of stipend support considering both school quality and type of institution is shown in Table 4.11. In two-thirds of the possible comparisons in this table, private school students reported stipend support from the Federal government more frequently than did public school students. There was great variation in extent of Federal support by field: at the one extreme, 78 per cent of the life

TABLE 4.8

COMPOSITE FIELD OF STUDY, CONTROL OF GRADUATE SCHOOL, AND SOURCE OF FIRST STIPEND HELD

(Per Cent of Stipend Holders)

Field of Study	School Control	Sources of First Stipend Held																					N
		Federal Government												Other									
		Total Federal	Atomic Energy Commission	Department of Defense	National Science Foundation	Veterans Administration	Nat'l Aeronautics and Space Adm.	Nat'l Defense Education Act	Other Office of Education	NIH[a] Fellowship	NIH Trainee	Other Public Health Service	Other Federal	Total Other	Foundation	Business	School, Directly	School Source Unknown	State Government	Local Government	Foreign Government	Other	
Physical science	Public	35	7	4	13	0	1	3	0	1	1	1	3	65	3	6	44	7	3	0	1	0	745
	Private	41	6	6	19	0	1	2	0	2	1	1	3	59	4	15	32	7	2	0	0	0	426
Engineering	Public	31	4	7	8	0	3	3	0	0	1	1	4	69	6	19	33	8	3	0	1	0	357
	Private	28	2	5	7	0	4	2	0	0	1	1	4	72	3	41	22	4	2	0	0	0	437
Life science	Public	43	1	1	17	0	0	3	0	4	11	3	3	57	2	3	35	11	5	0	1	0	593
	Private	55	2	1	15	0	0	0	0	10	23	4	1	45	1	1	23	8	10	0	2	0	163
Behavioral science	Public	36	0	3	4	1	0	6	1	9	4	4	4	64	4	1	41	8	7	0	2	0	444
	Private	43	0	1	6	4	0	5	0	9	11	3	3	57	7	5	34	5	4	0	2	0	217
Humanities	Public	12	0	1	0	0	0	9	0	0	0	0	2	88	6	0	64	7	9	0	3	0	245
	Private	8	0	0	0	0	0	7	0	1	0	0	0	92	13	2	59	5	11	0	2	0	172

N	3,799
No stipend	1,923
NA, source	86
Total	5,808

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[a] NIH = National Institutes of Health.

TABLE 4.9

COMPOSITE FIELD OF STUDY, QUALITY OF GRADUATE SCHOOL, AND SOURCE OF FIRST STIPEND HELD

(Per Cent of Stipend Holders)

Field of Study	School Quality	Sources of First Stipend Held																					N
		Federal Government												Other									
		Total Federal	Atomic Energy Commission	Department of Defense	National Science Foundation	Veterans Administration	Nat'l Aeronautics and Space Admn.	Nat'l Defense Education Act	Other Office of Education	NIH[a] Fellowship	NIH Trainee	Other Public Health Service	Other Federal	Total Other	Foundation	Business	School, Directly	School Source Unknown	State Government	Local Government	Foreign Government	Other	
Physical science	Group I	49	15	4	22	0	*	1	0	2	3	2	2	51	4	55	35	5	2	*	0	0	257
	Group II	36	8	5	14	0	1	1	0	2	1	1	3	64	4	6	43	8	3	0	*	0	408
	Group III	31	3	4	13	*	1	5	0	1	1	1	3	69	2	14	40	8	3	0	1	0	506
Engineering	Group I	38	5	7	13	0	2	2	0	0	2	2	5	63	3	17	33	5	3	0	1	0	192
	Group II	28	1	8	7	*	1	3	0	0	2	1	5	73	8	34	23	5	3	0	1	0	275
	Group III	28	3	5	5	*	6	3	1	1	0	1	4	72	3	37	26	6	1	0	*	0	327
Life science	Group I	49	3	1	10	0	0	0	0	10	21	4	1	51	1	3	31	14	3	0	0	0	146
	Group II	49	2	1	10	0	*	3	0	9	19	3	3	51	3	3	33	9	2	0	*	0	231
	Group III	42	1	*	23	0	0	3	0	3	7	3	2	58	2	2	32	10	10	0	1	0	379
Behavioral science	Group I	38	0	1	12	1	0	2	0	11	5	5	3	62	12	1	36	5	5	0	2	0	169
	Group II	41	0	3	3	2	0	6	*	11	9	3	3	59	3	2	38	8	7	0	1	0	239
	Group III	37	0	2	2	4	*	8	2	6	6	3	4	63	2	3	42	8	5	0	3	0	253
Humanities	Group I	4	0	0	0	0	0	3	0	0	0	0	2	96	17	0	60	6	11	0	2	0	113
	Group II	12	0	1	0	0	0	11	0	0	0	0	0	88	8	1	65	7	6	0	3	0	144
	Group III	13	0	1	0	0	0	9	0	1	0	0	1	88	4	3	60	5	13	0	3	0	160

N	3,799
No stipend	1,923
NA, source	86
Total N	5,808

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*Less than one-half of 1 per cent.

[a] NIH = National Institutes of Health.

TABLE 4.10

COMPOSITE FIELD OF STUDY, SIZE OF SCHOOL, AND SOURCE OF FIRST STIPEND HELD

(Per Cent of Stipend Holders)

Field of Study	School Quality	Sources of First Stipend Held																					N
		Federal Government												Other									
		Total Federal	Atomic Energy Commission	Department of Defense	National Science Foundation	Veterans Administration	Nat'l Aeronautics and Space Admn.	Nat'l Defense Education Act	Other Office of Education	NIH[a] Fellowship	NIH Trainee	Other Public Health Service	Other Federal	Total Other	Foundation	Business	School, Directly	School Source Unknown	State Government	Local Government	Foreign Government	Other	
Physical science	Small	35	4	7	13	0	1	6	0	1	1	0	2	65	3	15	37	7	3	0	1	0	271
	Large	37	8	4	16	0	1	2	0	1	1	1	3	63	3	8	41	7	3	0	1	0	900
Engineering	Small	31	3	3	8	1	4	5	1	1	0	1	3	69	3	34	24	7	1	0	0	0	146
	Large	29	3	7	7	0	3	2	0	0	1	1	5	71	4	30	27	5	2	0	1	0	648
Life science	Small	57	0	0	33	0	0	5	0	3	13	2	1	43	2	2	25	4	9	0	2	0	171
	Large	42	2	1	11	0	0	2	0	6	13	4	3	58	2	3	35	13	5	0	1	0	585
Behavioral science	Small	40	0	4	3	4	0	8	0	4	9	0	8	60	7	1	44	3	3	0	3	0	75
	Large	38	0	2	5	2	0	5	1	10	6	4	3	62	5	2	38	8	6	0	2	0	586
Humanities	Small	18	0	0	0	0	0	16	0	0	0	0	1	82	9	1	62	3	3	0	4	0	68
	Large	9	0	1	0	0	0	7	0	0	0	0	1	91	9	1	62	7	11	0	2	0	349

N	3,799
No stipend	1,923
NA, source	86
Total	5,808

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[a] NIH = National Institutes of Health.

TABLE 4.11

COMPOSITE FIELD OF STUDY, CONTROL AND QUALITY OF GRADUATE SCHOOL, AND SOURCE OF FIRST STIPEND

(Per Cent of Stipend Holders Receiving First Stipend
From Federal Government Agencies)

Field of Study	Quality of School	School Control	
		Public	Private
Physical science	Group I	45 (160)	56 (97)
	Group II	34 (268)	41 (140)
	Group III . . .	31 (317)	32 (189)
Engineering	Group I	44 (81)	32 (111)
	Group II	28 (132)	26 (143)
	Group III . . .	27 (144)	28 (183)
Life science	Group I	39 (110)	78 (36)
	Group II	45 (172)	63 (59)
	Group III . . .	43 (311)	37 (68)
Behavioral science	Group I	35 (104)	42 (65)
	Group II	40 (167)	44 (72)
	Group III . . .	34 (173)	43 (80)
Humanities	Group I	7 (60)	2 (53)
	Group II	12 (75)	12 (69)
	Group III . . .	15 (110)	8 (50)

N	3,799
NA, not applicable . . .	2,009
Total N	5,808

sciences students in high quality private schools held stipends from Federal agencies; at the other extreme, only 2 per cent of the humanities students in these same schools found support through Federal channels.

In the life and physical science fields of study students attending high quality private schools were more likely to receive Federal support than students attending public institutions of equal quality. Among engineering, humanities, and life science students attending Group III schools, those in public schools had the same or a better chance of holding stipends from Federal sources.

Federal agencies were mentioned much less frequently as donors of second stipends (Table 4.12). The Federal government was reported by _one-third or more_ of the stipend holders in nineteen of the thirty-five first stipend cells, and in only eight of the second stipend cells. Clearly, a Federal stipend was reported to be much more valuable than those from other sources.

Thus levels of Federal support depended on both field of study and institutional characteristics. In four of the five fields of study more than one-third of the students in the high quality schools reported that their stipends came from the Federal government, and two of these four percentages were very close to 50 per cent. Among the medium quality schools the proportion was one-third or more in only three of the fields, and in only one did it approach 50 per cent. Only two fields had one-third or more of their students supported by the Federal government in other schools.

Income Received from All Stipends

We now turn to a description of the income received by American graduate students from all stipends. The median dollar value of this stipend income was computed for recipients classified by field of study and type of institution attended. This median was derived from a class interval distribution, and is therefore approximate. Because of this, we ignore differences of $100 or less. Of the institutional characteristics, school quality was most important in accounting for differences in stipend income; control of the school was less so; size was the least important factor.

TABLE 4.12

COMPOSITE FIELD OF STUDY, CHARACTERISTICS OF GRADUATE SCHOOLS, AND SOURCES OF FIRST AND SECOND STIPENDS

(Per Cent of Stipend Holders Receiving Stipends from Federal Sources)

Field of Study	Number of Stipends Held	School Control		School Quality			School Size	
		Public	Private	Group I	Group II	Group III	Small	Large
Physical science	First	35 (745)	41 (426)	49 (257)	36 (408)	31 (506)	35 (271)	37 (900)
	Second . . .	29 (243)	33 (135)	24 (96)	37 (142)	29 (140)	24 (85)	32 (293)
Engineering	First	31 (357)	28 (437)	37 (192)	27 (275)	28 (327)	31 (146)	29 (648)
	Second . . .	14 (83)	21 (114)	17 (54)	14 (66)	23 (77)	15 (47)	19 (150)
Life science	First	43 (593)	55 (163)	49 (146)	49 (231)	42 (379)	57 (171)	42 (585)
	Second. . . .	36 (132)	34 (61)	25 (40)	38 (61)	39 (75)	38 (34)	35 (142)
Behavioral science	First	36 (444)	43 (217)	38 (169)	41 (239)	37 (253)	40 (75)	38 (586)
	Second . . .	21 (135)	18 (61)	20 (56)	22 (79)	20 (61)	17 (30)	21 (166)
Humanities	First	12 (245)	8 (172)	4 (113)	12 (144)	13 (160)	18 (68)	9 (349)
	Second . . .	12 (49)	2 (44)	- (31)	9 (32)	13 (30)	5 (20)	8 (73)

N, first stipend	3,799	N, second stipend	1,040
NA, not applicable	2,009	NA, not applicable	4,768
Total	5,808	Total	5,808

TABLE 4.13

COMPOSITE FIELD OF STUDY, CHARACTERISTICS OF GRADUATE SCHOOL, AND MEDIAN INCOME FROM ALL STIPENDS HELD

(Among Stipend Holders)

Field of Study	School Control				School Quality						School Size			
	Public		Private		Group I		Group II		Group III		Small		Large	
	Median	N	Median	N	Median	N	Median	N	Median	N	Median	N	Median	N
Physical science. . .	$2,580	751	$2,850	430	$3,240	260	$2,830	412	$2,000	507	$2,260	271	$2,680	710
Engineering	2,280	357	1,950	440	3,090	189	2,270	276	1,400	332	2,220	149	2,160	648
Life science	2,630	604	2,970	166	3,070	149	2,810	231	2,360	390	2,620	176	2,690	594
Behavior science . .	2,340	447	2,780	225	2,790	172	2,550	242	2,100	258	2,540	76	2,450	596
Humanities	1,990	246	1,970	179	2,430	116	2,040	143	1,740	166	2,020	73	1,980	352

N	3,854
NA, not applicable . .	1,963
Total N	5,808

TABLE 4.14

COMPOSITE FIELD OF STUDY, CONTROL AND QUALITY OF GRADUATE SCHOOL, AND MEDIAN INCOME FROM ALL STIPENDS

(Among Stipend Holders)

Field of Study	School Control	School Quality					
		Group I		Group II		Group III	
		Median	N	Median	N	Median	N
Physical science	Public	$2,880	162	$2,720	270	$2,140	319
	Private	3,720	98	3,090	142	1,390	190
Engineering	Public	2,450	80	2,530	132	2,010	145
	Private	3,490	109	1,670	144	830	187
Life science	Public	2,930	112	2,740	173	2,370	319
	Private	3,570	37	3,300	58	2,270	71
Behavioral science	Public	2,680	106	2,400	166	2,060	175
	Private	3,140	66	3,070	76	2,320	83
Humanities	Public	2,440	62	2,090	73	1,760	111
	Private	2,420	54	1,950	70	1,690	55

N 3,845

NA, not applicable . . . 1,963

Total N 5,808

Size made only one difference; physical science students in large schools reported that their stipends were worth about $400 more than those of physical science students in small schools.

Private school students in physical, life, and behavioral science fields reported stipends worth $300 more than those received by students in the same fields in public schools. But public school students in engineering held stipends worth $300 more than those held by private school engineering students.

A direct relationship obtained between quality of graduate school and value of all stipends: the higher the quality of the graduate school, the more valuable the stipends received. Students in Group I schools, depending on their field of study, received stipends worth $200 to $800 more than the students in Group II schools, and the students in the latter schools received (depending again on field of study) between $300 and $900 more than the students in Group III schools.

Combining school quality and control, the relationship between quality and value of stipends was unchanged, but the pattern by control was modified. Students in high quality private schools reported stipends that were between $500 and $1,000 greater than those obtained by students in public schools, depending on field of study. However, there was no difference in the value of the stipends of the humanities students in high quality public and private schools. Students in Group III public schools reported stipends worth between $100 and $1,200 more than students in Group III private schools depending on field of study.

Dollar amounts reported by graduate students as income from stipends were as follows: Students in all five fields at high and medium quality schools received more than $2,000; the students of physical and life sciences, and engineering in high quality private schools increased this figure by over $1,000. Except for the humanities, recipients in high quality private schools all reported stipends worth over $3,000.[4]

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[4] One possible procedure for assessing the differences in cost between public and private institutions or schools of different quality goes as follows: compute an average cost of tuition and fees for each school in the sample; consider only amounts greater than the differences produced by this adjustment. However, tuition structures vary within universities, and students carry different course loads. Since a computation of costs per course for each student in each institution was not feasible, the reader will note that the analysis was based on respondents' reports of their costs, and differences were discussed on this basis.

Summary

Stipend holding was associated with school quality among students enrolled for advanced study in five composite fields covering engineering, the sciences, and several of the humanities. Between 62 and 92 per cent of the students, depending on field of study, in high quality (Group I) schools held stipends in contrast with some 38 to 76 per cent of their counterparts in Group III schools. Types of stipends held during the period under study as well as extent of stipend holding varied by institutional quality and by type of control. Stipends from Federal agencies were more frequently reported by those attending high quality schools, and their stipends had a higher dollar value as well. Other institutional characteristics--institutional control and size of student enrollment--were also considered, but were not as significant as institutional quality in accounting for the extent of stipend holding in these five fields of study, type of stipend received, source of stipend, or value of stipend.

CHAPTER 5

SOURCES OF INCOME

In this chapter we describe the sources of economic support reported by American graduate students. These sources are many. Understanding how graduate students support themselves and their families involves knowing both the sources of support and their interrelationships; for example, if students are supported by one or by a variety of sources, and the relative importance of these sources.

Preceding chapters have shown that a variety of personal and academic characteristics of graduate students were significantly related to stipend holding. In this chapter we relate income derived from stipends to total income and analyze stipends as one component of all income sources.

Sources of Income

The questionnaire classified sources of income into four broad categories:

1. Stipend income.--Any money received by the student the university to further the student's education which does not need to be repaid and is not from parents or relatives. Students could report as many as three stipends. Thus information on amounts and types of stipends, if students had more than one, was secured as well as the total stipend income.[1]
2. Other income.--Any money received from nonacademic sources, such as income derived from full- or part-

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[1] Preliminary analysis indicated little reason to differentiate income derived from the second and the third stipend sources; only 2 per cent of the students held third stipends. Thus second and third stipend incomes were combined.

time employment, gifts from parents, spouse's employment and stipend income, and veterans' benefits and military pay.

3. Reduction in assets.--Withdrawal of savings, selling stock, car, house, etc. Very few students indicated they had reduced their assets and, if they had, the amounts were so low as to be of little or no importance in income.

4. Additions to liabilities.--Loans for education and nonacademic purposes were listed by source: National Defense Education Act Loan, other educational loans, or noneducational sources.

For purposes of presentation and analysis, total income in this chapter is regarded as the sum of the total stipend and other income categories. Veterans' benefits, military service income, and a residual "other income" ~~category~~ (see p. 12 of the questionnaire, Appendix 4) were not tabulated separately because negligible proportions of students reported any income from either veterans' benefits or military service.

Graduate students in the five composite fields covered in this survey reported their financial situations for the period of July, 1962, to June, 1963. The total median income of all students was $5,200 (Table 5.1). Almost 90 per cent of the students reported receiving income from nonstipend sources, and 66 per cent reported income from stipends. Furthermore, total median income from nonstipend sources was greater ($3,800) than that derived from stipends ($2,400). Comparison of specific nonstipend sources, however, showed a slightly different pattern.

A greater proportion of students received income from stipends (66 per cent) than from any other single source; 57 per cent reported income from full- or part-time nonstipend employment, 28 per cent from their spouses, and 26 per cent reported support from family gifts. Looking at both frequency of occurrence and median cash value from these sources, nonacademic employment was the single largest income source, contributing $4,000, followed by spouse's income ($3,200), and the

TABLE 5.1

SOURCES OF INCOME AMONG AMERICAN GRADUATE STUDENTS BY COMPOSITE FIELD OF STUDY

(Per Cent Reporting Any Income* and the Median Cash Value among Those Reporting Any)

Field of Study	Total Income		Total Income from Stipends		First Stipend Reported		Second and/or Third Stipend		Total Non-stipend Income		Your Own Job		Spouse's Job and/or Stipend		Gifts from Parents		N
	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	
Physical science .	99	$4,800	74	$2,500	--[a]	$2,300	24	$700	85	$3,000	53	$3,000	28	$3,000	25	$300	1,617
Engineering	98	7,900	61	2,200	--	1,900	15	900	92	7,200	76	7,500	19	2,900	16	400	1,328
Life science .	99	4,300	80	2,600	--	1,900	19	800	84	2,400	40	2,000	32	3,000	29	300	1,004
Behavioral science .	98	4,800	64	2,400	--	2,200	19	700	89	3,400	55	1,800	34	3,300	32	400	1,055
Humanities.	98	4,700	46	2,000	--	1,900	11	400	93	4,000	60	3,000	31	4,500	30	500	932
Total, five fields .	98	5,200	66	2,400	66	2,200	18	700	89	3,800	57	4,000	28	3,200	26	400	5,936

N	5,936
Aliens	878
Total N . . .	6,814

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[a] Indicates base is too small to percentage.

respondent's stipend income ($2,400). The median income from gifts from parents or relatives was negligible--$400. Among the American graduate students sampled in this survey, earnings from nonstipend employment and from stipends were the two primary sources of economic support.

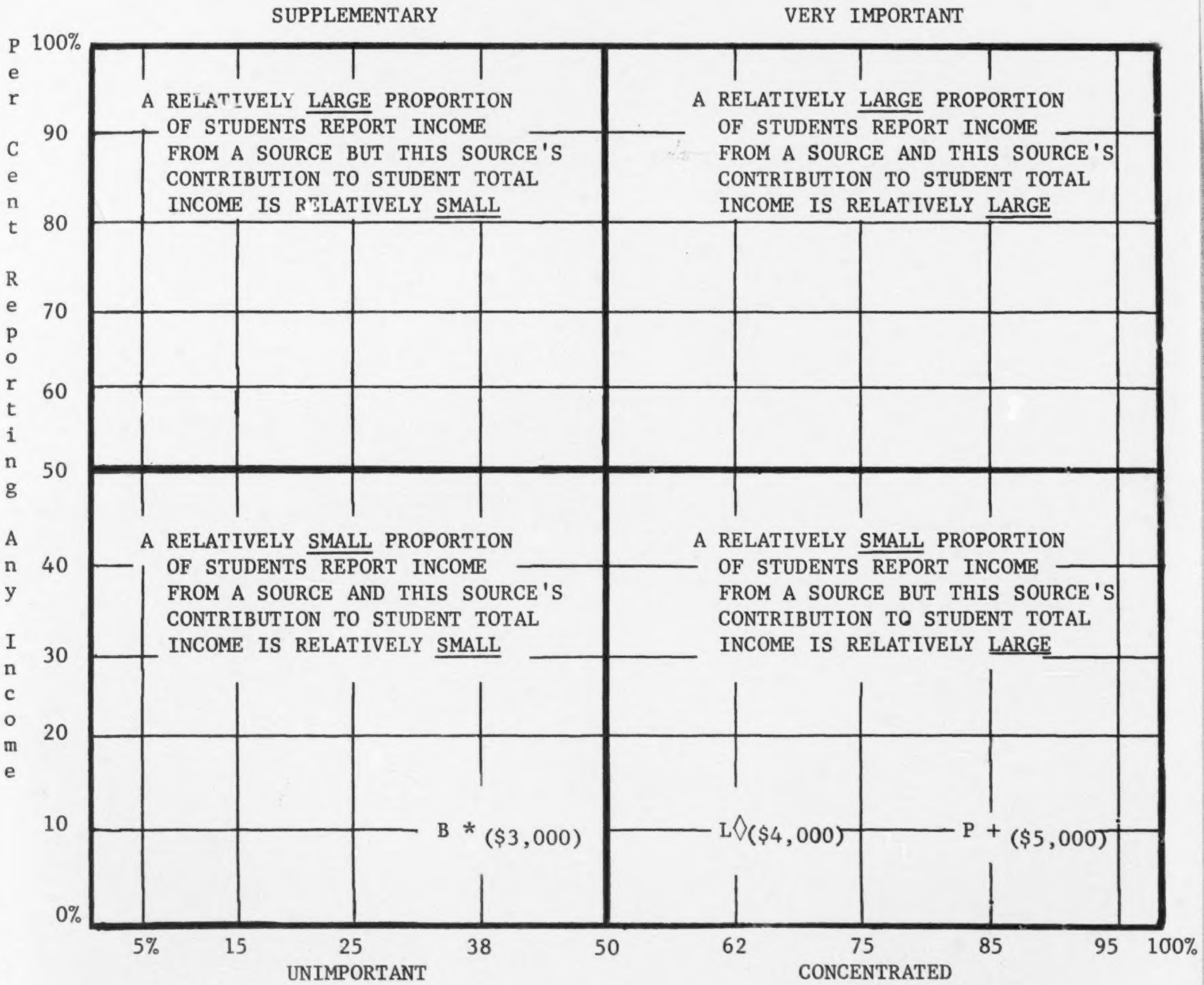
Data in Table 5.1 refer to the proportion of students receiving any income from specific sources and the median cash value of the specific source among these students. In his discussion of graduate student incomes, Davis (1962, p. 39) showed that the intensity of an economic source was also valuable for an understanding of students' resources. By "intensity" he meant the proportion of a student's total income derived from any specific source. The measure of intensity combined two items: frequency of occurrence and the importance of its contribution to total income. This should present a more complete picture of the economics of graduate study.

The vertical dimension of Charts 1 through 6 indicates the proportion of students reporting any income from a given source. This is the frequency of occurrence. The horizontal scale shows the median contribution to the total income of each of four sources, among those students who report any income from each source.

> When we think of a given source as being "important," we probably mean either that it is quite common or, regardless of its frequency, it is a major source of income for those who receive it. . . . We can then think of four basic kinds of sources: 1. Very important: sources which are both frequent and yield a high proportion of the total income among recipients; 2. Supplementary: sources which are rather common but bring in only a low proportion of the total income of the recipients; 3. Concentrated: sources which are relatively infrequent but which contribute a high proportion of the incomes of those who have access to them; 4. Unimportant: sources which do not occur very often and which, when they do, account for only a low proportion of the income of recipients (Davis, 1962, p. 39).

Fifty per cent was selected to distinguish between "high" and "low" levels of: (1) any income from a given source and (2) importance of the contribution of the income from a given source. Thus any sources reported by 50 per cent or more of a group of students and contributing

EXPLANATORY CHART



Proportion of Total Income from Each Source (among at Least 50 Per Cent of Each Specific Group of Students)

Legend		
Non-alphanumeric symbol indicates sources of support. * = Total stipends ◊ = Self-employment + = Spouse's income	Alphanumeric symbol indicates academic or non-academic control variable. B = Behavioral science students L = Life science students P = Physical science students	($3,000) - Amount in parentheses indicates median cash value of source.

50 per cent or more to the total income were considered very important; those reported by less than 50 per cent but contributing more than 50 per cent to the total income were concentrated; those reported by more than 50 per cent but not contributing at least 50 per cent to the total income were supplementary; and those sources less than 50 per cent on both dimensions were categorized as unimportant. Also included in the charts, in parentheses, were the median incomes for a given source among a given group of students (see Explanatory Chart).

Chart 5.1 shows the importance of four sources of income (stipends, self-employment, spouse's employment, and gifts from parents or relatives) by composite field of study. As expected, income derived from stipends and income from employment were both very important; income derived from spouse's employment and gifts from parents or relatives were unimportant.

Students in the sciences and humanities reported approximately similar total incomes (roughly $4,300-$4,800). Students in engineering, however, had considerably higher median incomes ($7,900). For both stipends and employment, the higher the proportion of students reporting income from each source, the larger the median cash value reported. For example, 80 per cent of life science students reported income from stipends having a median value of $2,600, while only 46 per cent of humanities students had stipends having a median of $2,000. Engineering students were most likely to report employment income (76 per cent), and their median earnings were highest ($7,500), while life science students were least likely to have had employment income (40 per cent), and their earnings from nonstipend employment were lowest ($2,000).

Although stipends and nonacademic employment were very important sources of income for the American graduate students in this survey, there was variation by composite field of study. The very important sources within each field, listed in order of importance, were:

Life sciences	stipends
Physical sciences	stipends and nonstipend employment
Behavioral sciences	stipends and nonstipend employment
Engineering	nonstipend employment and stipends
Humanities	nonstipend employment

Thus all the possible patterns occurred: stipends were the primary source of support among life science students. Physical and behavioral science students relied most heavily on this source, although they also reported nonstipend employment as very important. Engineering students reported relying most heavily on nonstipend employment, although stipends were also very important. Humanities students reported only nonstipend employment as a very important source of income.

Chart 5.1 further shows that income derived from spouse's employment was concentrated for students in the fields of life and behavioral sciences and the humanities. This was most likely a function of the higher proportion of female students in these three fields. Also, no appreciable variation in proportion of gifts from parents or relatives occurred by field of study.

Students in the life, physical, and behavioral sciences reported that their primary (although not necessarily sole) source of support was their stipend. Graduate engineering students were different, because a B.S. in engineering generally has been considered sufficient academic training to qualify for full-time employment. Indeed, there is considerable competition for new engineers at lucrative salaries.[2] While a majority of the students in this field held stipends with a median income of $2,200, a larger proportion (76 per cent) were employed, deriving a median income from this employment of $7,500. Either part-time employment on engineering jobs is exceptionally high or (as comments in the questionnaires lead us to believe) many employers will continue to pay their engineers to return to graduate school for advanced study. Humanities was the sole field in which stipend support was not classified as very important. For whatever reasons, stipend donors in 1963 concentrated on other fields, and students in the humanities (i.e., history and English) reported income from other sources.

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[2] Many advertisements for engineers with only a B.S. indicate starting salaries much higher than those reported here. The contemporary phenomena of on-campus recruiting of graduating seniors also testifies to the availability of jobs for engineering students.

CHART 5.1

INTENSITY OF SOURCES OF INCOME, BY COMPOSITE FIELD OF STUDY

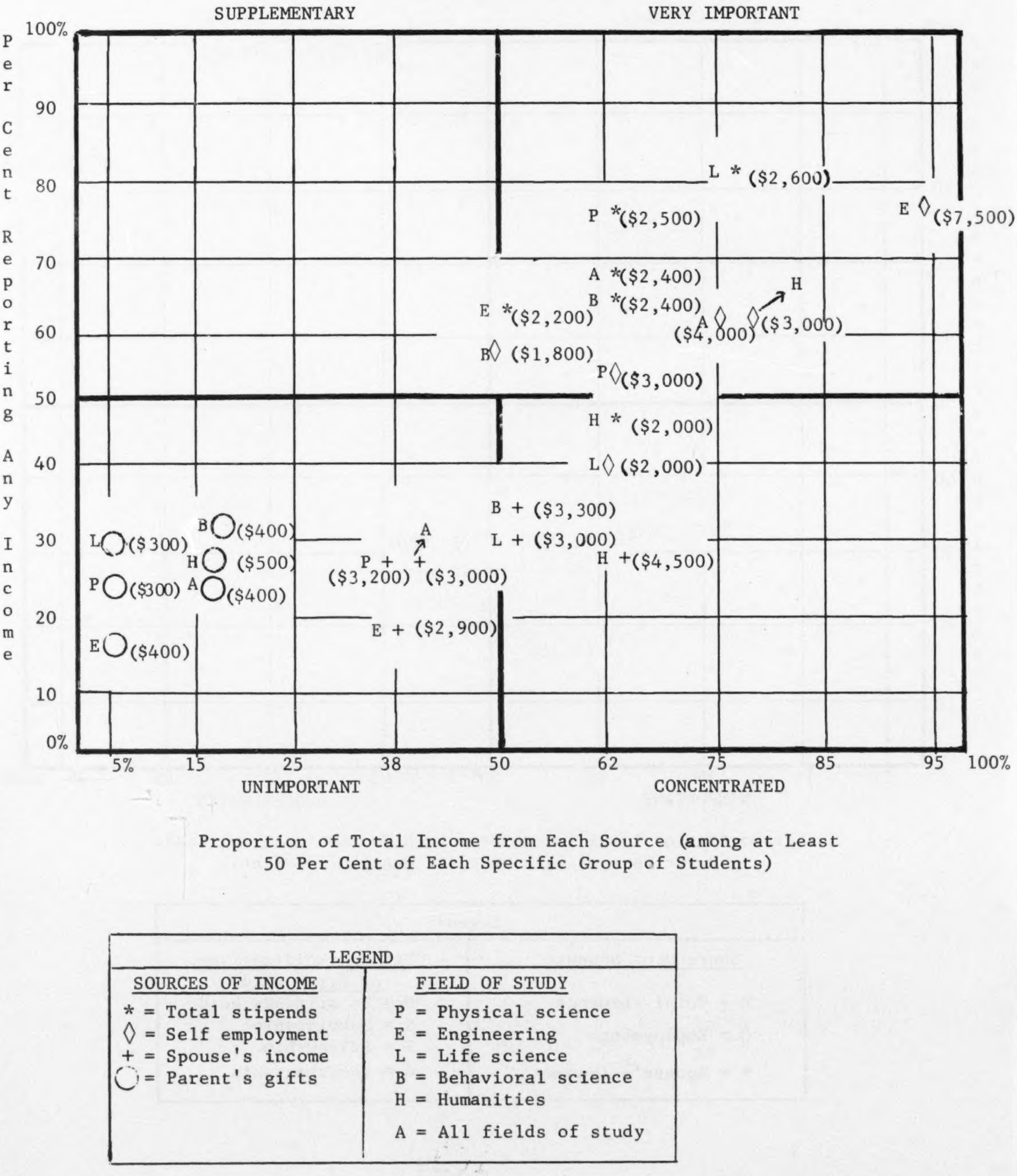
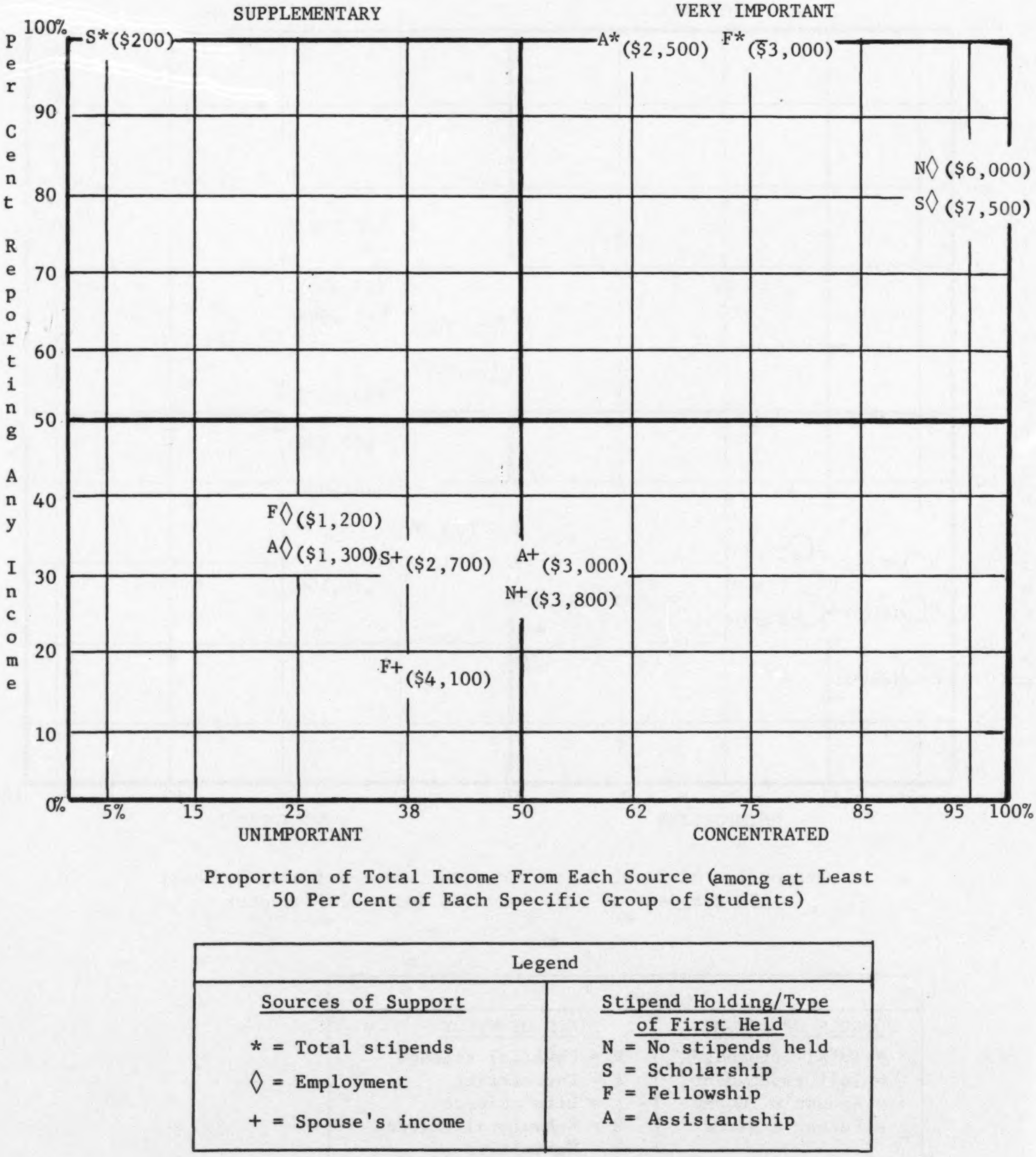


CHART 5.2

INTENSITY OF SOURCES OF INCOME BY STIPEND HOLDING AND TYPE OF FIRST STIPEND HELD



Correlates of Sources of Income

Prior analysis has shown that important variations existed among these fields of study in rates of stipend holding, types of stipends held, enrollment, stage of study, and quality of graduate school. We now examine the relationship between these characteristics and the primary sources of student income: stipends, nonstipend employment, and spouse's income.

We first consider stipend holding and type of first stipend. Types of stipends have been collapsed into three groups--assistantships, fellowships, and scholarships. Table 5.2_b_ shows that students who held scholarships as their first stipend showed a profile more akin to students who did not hold stipends, in terms of pattern of sources of income and median of total income, than to students holding other types of stipends.

Chart 5.2 indicates that nonstipend employment was the only source classified as _very important_ for scholarship holders and those without stipends. Among students holding fellowships or assistantships only stipends were classified as _very important_. It is surprising to learn that scholarship holders earned more from nonstipend employment and had higher total incomes than students not holding stipends, and that students with fellowships had higher total incomes than students with stipends requiring duties (see Table 5.2_b_).

Students holding fellowships seemed to have had the most advantageous situation in graduate school, in terms of stipend income. Although their total income was as not as high as that shown for scholarship recipients, it certainly was not so low as to cause serious inconveniences in living. Scholarship students and those without stipends, as we know, were not likely to be enrolled in school full time (31 and 33 per cent were full time, compared to 78 per cent of the fellows and assistants). They maximized their immediate earning capacity at the expense of rapid progress through graduate school. Fellowship holders had a higher median income ($4,800) than students whose stipends required duties ($3,900). However, the long-term effects of these disparities are indeterminate: research and teaching duties may lead to more thorough training, and lower total income may spur students

TABLE 5.2

SELECTED ACADEMIC AND NONACADEMIC CHARACTERISTICS, MEDIAN TOTAL INCOME, AND MEDIAN INCOME FROM SELECTED SOURCES

Selected Characteristics	Median				Total N[a]	NA
	Total Income	Stipend Income	Employment	Spouse's Income		
a) Field of Study						
Physical science	$4,800	$2,500	$3,000	$3,000	1,617	
Engineering	7,900	2,200	7,500	2,900	1,328	
Life science	4,300	2,600	2,000	3,000	1,004	
Behavioral science . . .	4,800	2,400	1,800	3,300	1,055	
Humanities	4,700	2,000	3,000	4,500	932	
Total	5,200	2,400	4,000	3,200	5,936	
b) Stipend Holding						
No stipend	6,900	---	6,000	3,800	1,988	87
Scholarship	8,000	200	7,500	2,700	650	
Fellowship	4,800	3,000	1,200	4,100	1,100	
Assistantship	3,900	2,500	1,300	3,000	2,101	
	N = 5,936					
c) Enrollment Status						
Full time	4,000	2,700	1,200	3,000	3,279	187
Part time	7,300	1,300	7,000	3,600	2,470	
	N = 5,936					
d) Stage of Study						
Master's: I	4,700	2,000	3,000	3,000	2,246	623
II	5,400	2,200	5,000	5,000	1,226	
Doctorate: III	5,300	2,600	2,600	3,500	709	
IV	5,200	3,100	2,700	2,800	1,132	
	N = 5,936					

TABLE 5.2--Continued

Selected Characteristics		Median				Total N[a]	NA
		Total Income	Stipend Income	Employment	Spouse's Income		
e) Field of Study	School Quality						
Physical science	Group I . .	$4,300	$3,000	$1,300	$3,000	296	
	Group II .	4,200	2,800	1,600	3,100	525	
	Group III .	5,500	2,100	6,000	3,000	774	
Engineering	Group I . .	5,500	3,000	2,400	2,600	257	
	Group II .	7,600	2,300	7,300	2,800	418	
	Group III .	8,000	1,400	8,000	3,000	633	
Life science	Group I . .	4,200	3,000	900	3,000	163	
	Group II .	4,200	2,700	2,200	3,200	270	
	Group III .	4,300	2,400	2,800	3,000	514	
Behavioral science	Group I . .	4,500	2,700	1,800	3,300	209	
	Group II .	4,900	2,500	1,800	3,300	365	
	Group III .	4,800	2,100	2,500	3,400	475	
Humanities	Group I . .	4,200	2,400	1,500	3,600	192	
	Group II .	3,800	2,100	1,800	3,100	270	
	Group III .	5,000	1,800	4,300	5,000	447	
	N = 5,808						
f) Family Role							
Men	Single . .	3,200	2,400	1,500	---	1,758	131
	Husband . .	6,900	2,500	2,500	3,500	1,016	
	Father . .	7,000	2,500	7,200	1,700	2,030	
Women	Single . .	3,200	2,200	3,600	---	573	
	Wife . . .	6,700	2,200	2,100	4,300	159	
	Mother . .	9,500	2,100	3,000	7,600	242	
	N = 5,936						

School N . .	5,808	Student N . .	5,936
		Aliens N . .	878
		Total N . .	6,814

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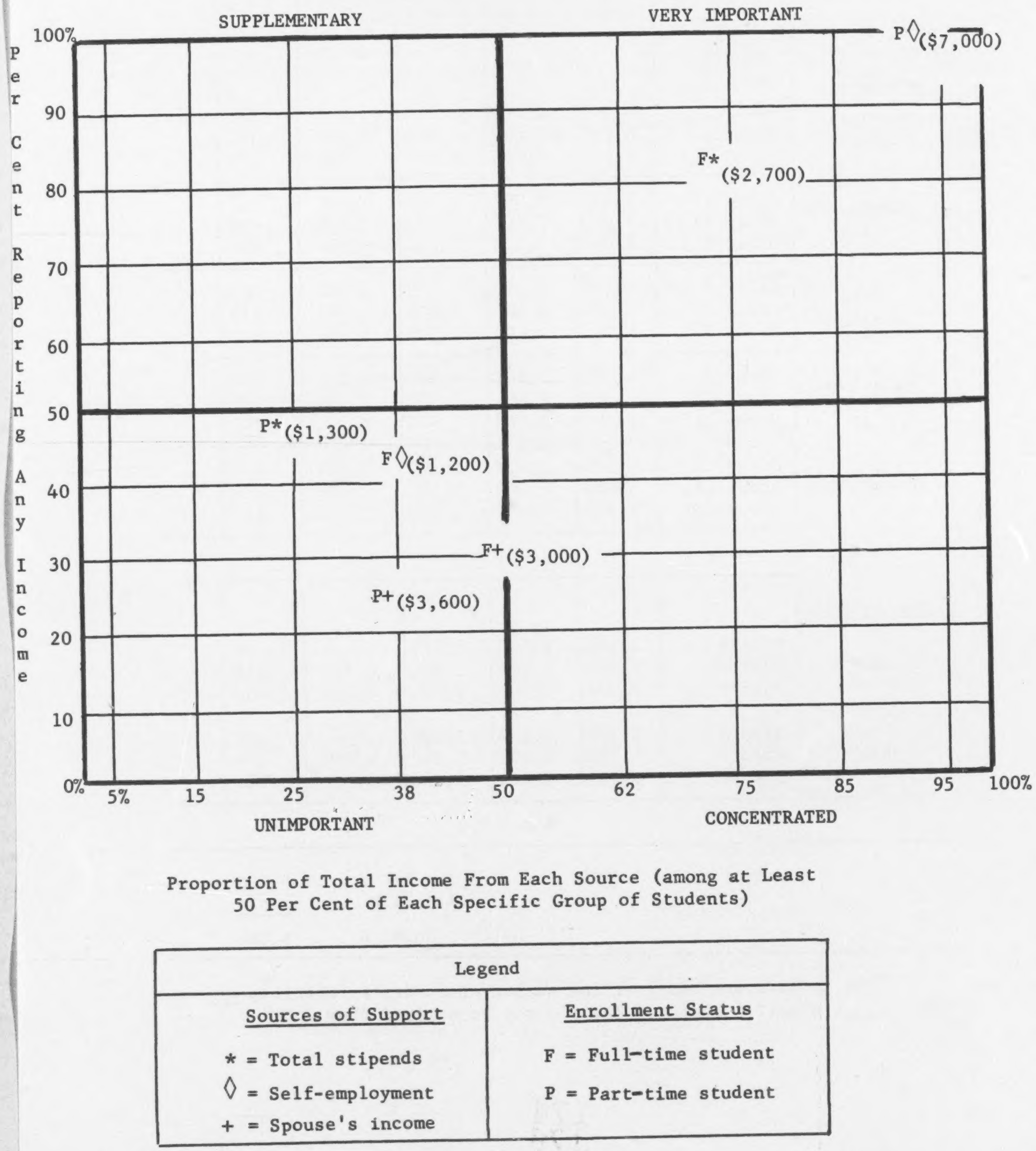
[a] The medians are based on the number of students reporting any income from a specific source. The N's may be derived from Table 5.1.

CHART 5.3

INTENSITY OF SOURCES OF INCOME BY ENROLLMENT STATUS DURING SPRING, 1962-1963



holding assistantships to faster degree completion, regardless of enrollment discrepancies.

Given the close connection between enrollment status and stipend holding during the spring of 1962-63, stipend income should be an important component of total income among full-time students.[3] Income from nonstipend employment should be equally important among part-time students. Chart 5.3 and Table 5.2c indicate this is indeed the case. Among full-time students only stipend income was very important: 81 per cent held stipends. This source contributed a median of 75 per cent of total income, and the median cash value of all stipends held was $2,700. Income derived from nonstipend employment was unimportant, and income derived from spouse's employment was on the borderline between concentrated and unimportant. However, total median income of the full-time students was $4,000 (see Table 5.2). This was $1,300 more than the median stipend value (Chart 5.3), which indicates that a combination of sources was used by most of these students to achieve their total incomes. A variety of sources, then, were associated with full-time study.

The above conclusion is particularly true if full-time and part-time students are compared; the primary source of income of students enrolled part time was nonstipend employment. Ninety-four per cent were so employed, and this source contributed over 90 per cent of their total income. The other two sources were both categorized as unimportant, and both were less important for part-time than for full-time students. Thus part-time students, who were more likely to work, derived a larger proportion of their income from a single source than did full-time students. Studying or working for a degree did not yield immediate economic rewards; but part-time pursuit of advanced degrees while committing time to nonacademic endeavors produced greater immediate financial benefits. Chapter 3 showed that many part-time students had family responsibilities and presumably needed the higher income permitted by part-time study.

We have considered student sources of income, the frequency of their occurrence, the proportion of each in its contribution to total

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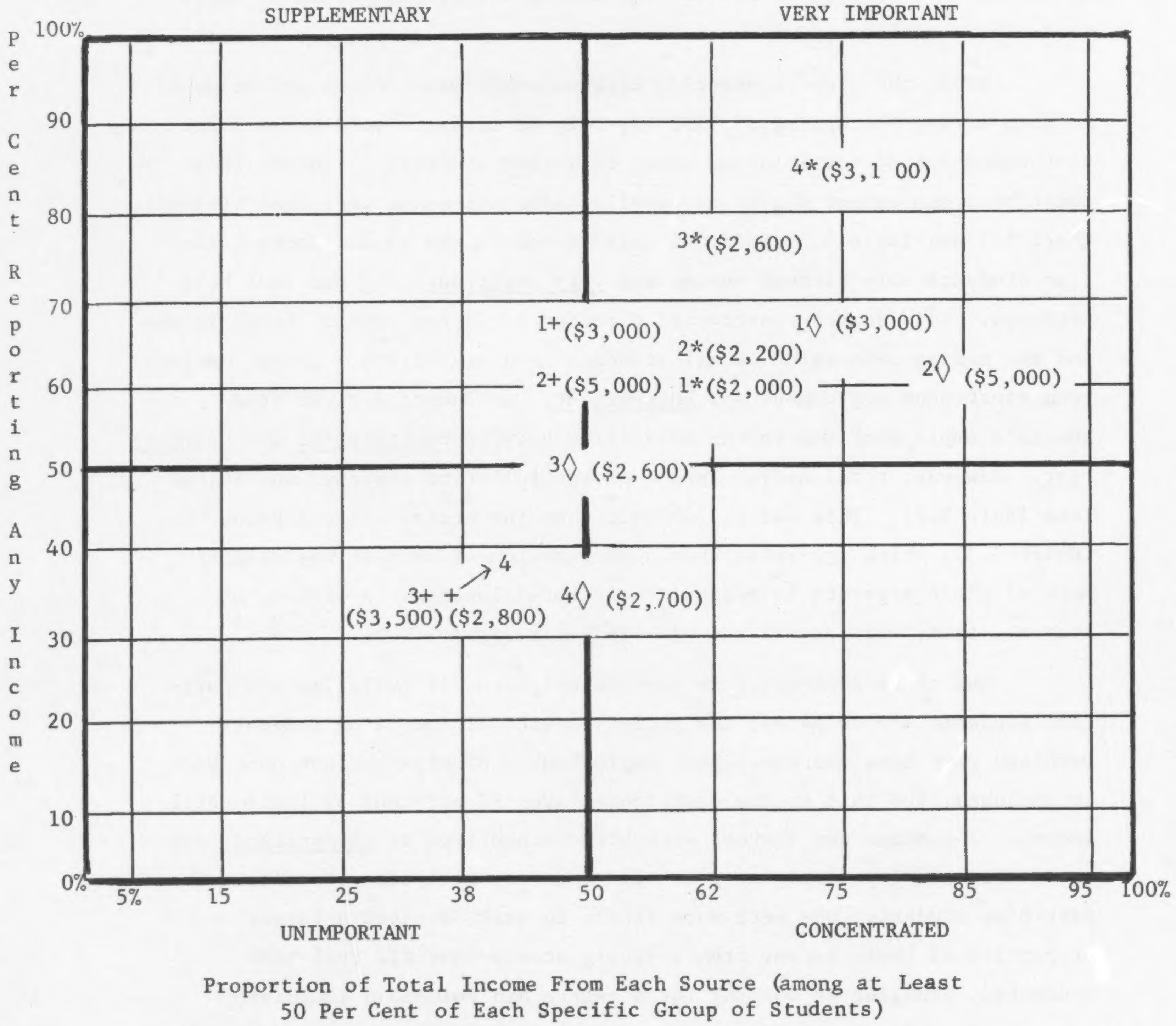
[3] See Chapter 3 for the classification of full-time and part-time enrollment.

CHART 5.4

INTENSITY OF SOURCES OF INCOME BY ACADEMIC STAGE OF STUDY



Legend		
Sources of Support	**Stage of Study**	
* = Total stipends ◊ = Self-employment + = Spouse's income	1 = Students enrolled less than one academic year 2 = Students enrolled more than one academic year and who are seeking master's degree	3 = Students enrolled more than one year, seeking doctorate, but not working on thesis 4 = Students enrolled more than one year, seeking doctorate and are working on thesis

income, and the median cash value of each source. Total income varied by field of study, stipend holding, type of stipend, and enrollment status. Next, we consider whether sources of income varied in importance among students at various stages of graduate study.

Total median income did not vary by stage of study (Chart 5.4 and Table 5.2d), with the one exception that students in Stage I had a median total income of $4,700, the corresponding median among Stage II students amounting to $5,400. The total income of students at each stage of study was very close to the average for all students in the sample--$5,200. The sources which contributed to these totals, however, varied considerably and consistently. Stipend income was a more important source of support as stage of study advanced, while other sources, employment, and income from spouse's employment decreased in importance with each successive stage of study (Chart 5.4).

For example, stipend income increased from Stages I to III in frequency of occurrence and median value of stipends, but in Stage IV frequency of occurrence, median value, and proportion of total income all increased.

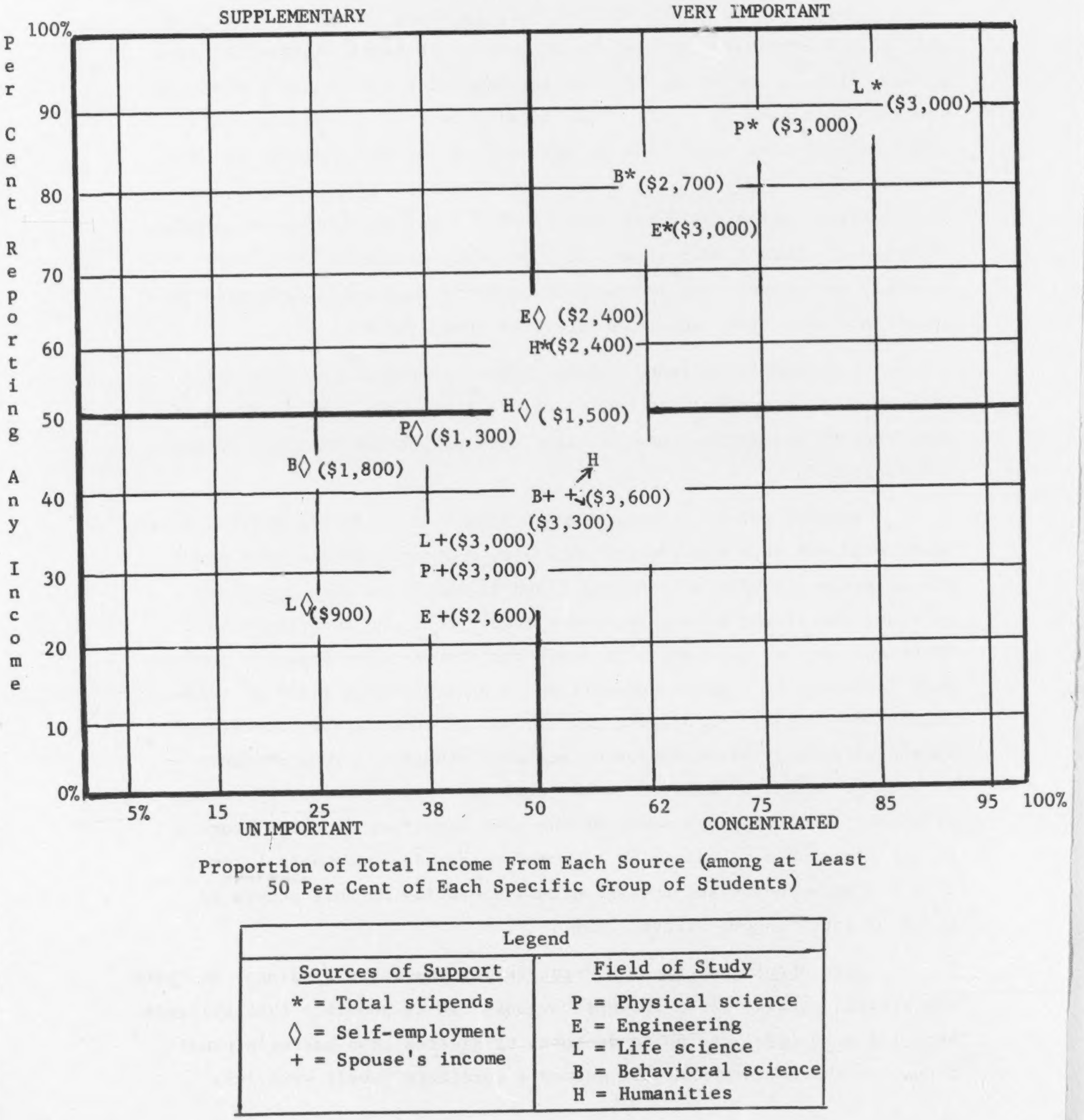
Several points deserve comment here. As seen from Chart 5.4, among students in Stage IV, the only very important source of support was stipends. Students in Stages I and II had three very important sources, and of the three, nonstipend employment was the single most important source. We have also shown that income from spouse's employment (a source of support unimportant in understanding field of study, stipend holding, or enrollment status) was of considerable importance in understanding the economics of academic progress. Thus students in earlier stages of academic study utilized a wide variety of sources of support, but stipends were not the most important of these sources. On the other hand, students in advanced stages derived their incomes from a single source and therefore relied heavily on this source in terms of total income derived from it.

Care should be taken in interpreting the above findings, as there are several equally valid interpretations. It is possible that stipends were far more likely to go to doctoral candidates than master's candidates, or that students at the master's candidate levels were less

CHART 5.5

INTENSITY OF SOURCES OF INCOME AND FIELD OF STUDY CONTROLLING FOR QUALITY OF GRADUATE SCHOOL

a) Students Attending Group I Schools



committed to pursuing graduate training on a full-time basis than were students seeking their doctorates. We do not know whether it is student commitment to graduate school or institutional preferences for students seeking the doctorate which determines the frequency and proportion of income derived from stipends. Most likely it is an interplay of the two.

Turning next to the relationships among sources of income, school quality, and field of study,[4] several general findings emerge from Table 5.2_e_ and Chart 5.5_a_, _b_, and _c_.

1. With the exception of students in life sciences there was an inverse relationship between cash value of total median income and school quality. The higher the quality of the school, the lower the total median income among the students in any given field of study. The strength of this relationship varied by field, being greatest in engineering fields and least in behavioral sciences fields.
2. The proportion of students holding stipends and the median value of all stipends held decreased as school quality declined, although the magnitude of this relationship for both proportion of income and median value of stipends varied by field of study. The relationship was least noticeable in the life sciences and most noticeable in humanities and engineering. The median cash value of total stipends especially varied inversely with school quality.
3. Within each level of school quality there was a stable rank ordering of fields: Students in the life sciences held more valuable stipends than behavioral scientists, etc. Furthermore, stipends contributed proportionally more to the total income of students in life sciences, followed respectively by students in physical sciences, behavioral sciences, engineering, and humanities at each level of institutional quality.

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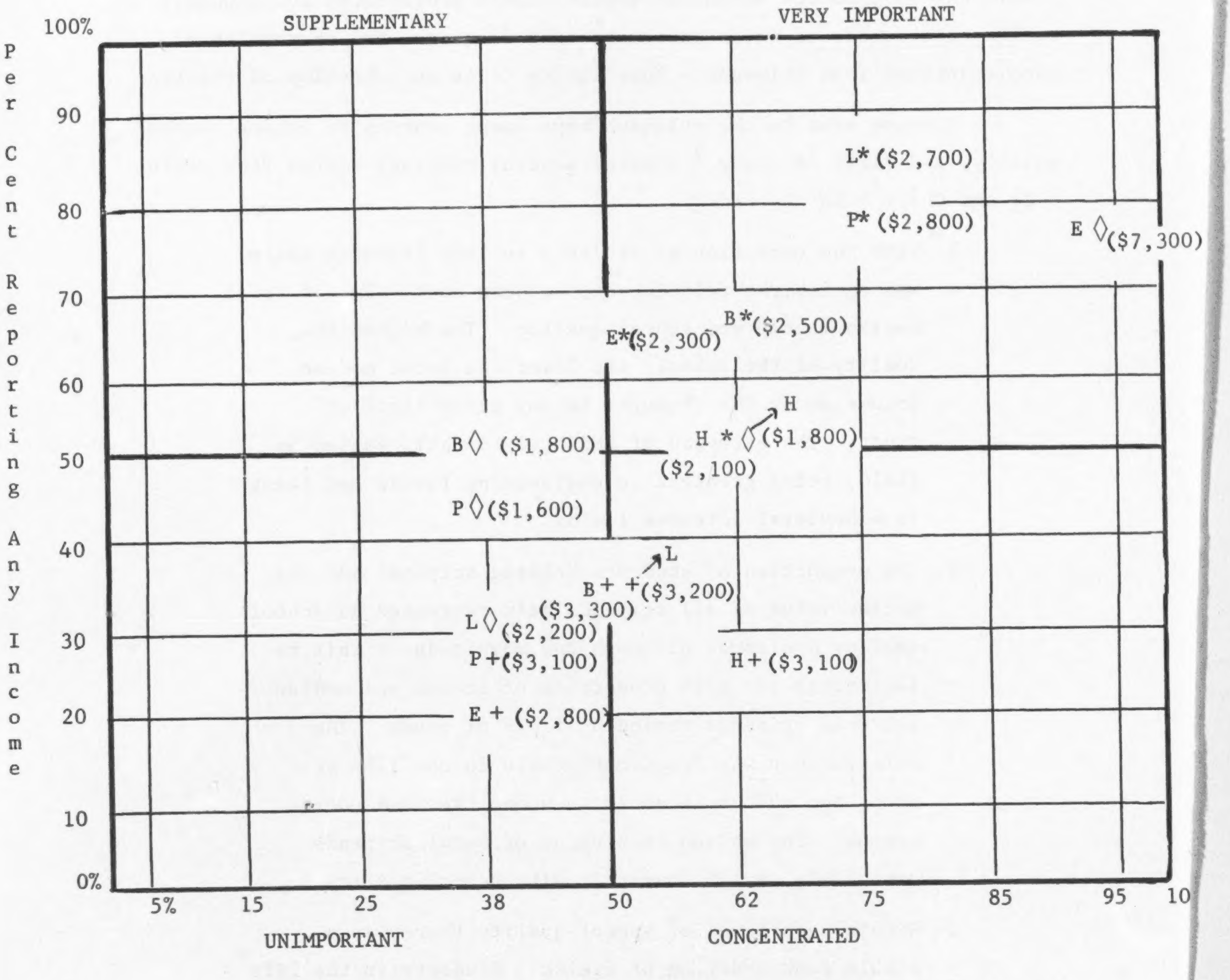
[4] The findings presented below are subject to the limitations discussed in Chap. 4, n. 4.

CHART 5.5

INTENSITY OF SOURCES OF INCOME AND FIELD OF STUDY CONTROLLING FOR QUALITY OF GRADUATE SCHOOLS

b) Students Attending Group II Schools



4. However, very important sources of income varied considerably by field of study and school quality. Shown below in order of importance are the sources of income classified as very important for each field of study within each quality level.

Field of Study	School Quality		
	Group I[a]	Group II	Group III
Life science . . .	Stipend	Stipend	Stipend
Physical science .	Stipend	Stipend	Employment, stipend
Behavioral science	Stipend	Stipend	Employment, stipend
Engineering . . .	Stipend, employment	Employment, stipend	Employment
Humanities	Stipend	Stipend, employment	Employment

[a] In high quality schools employment was classified as unimportant in all fields of study except engineering.

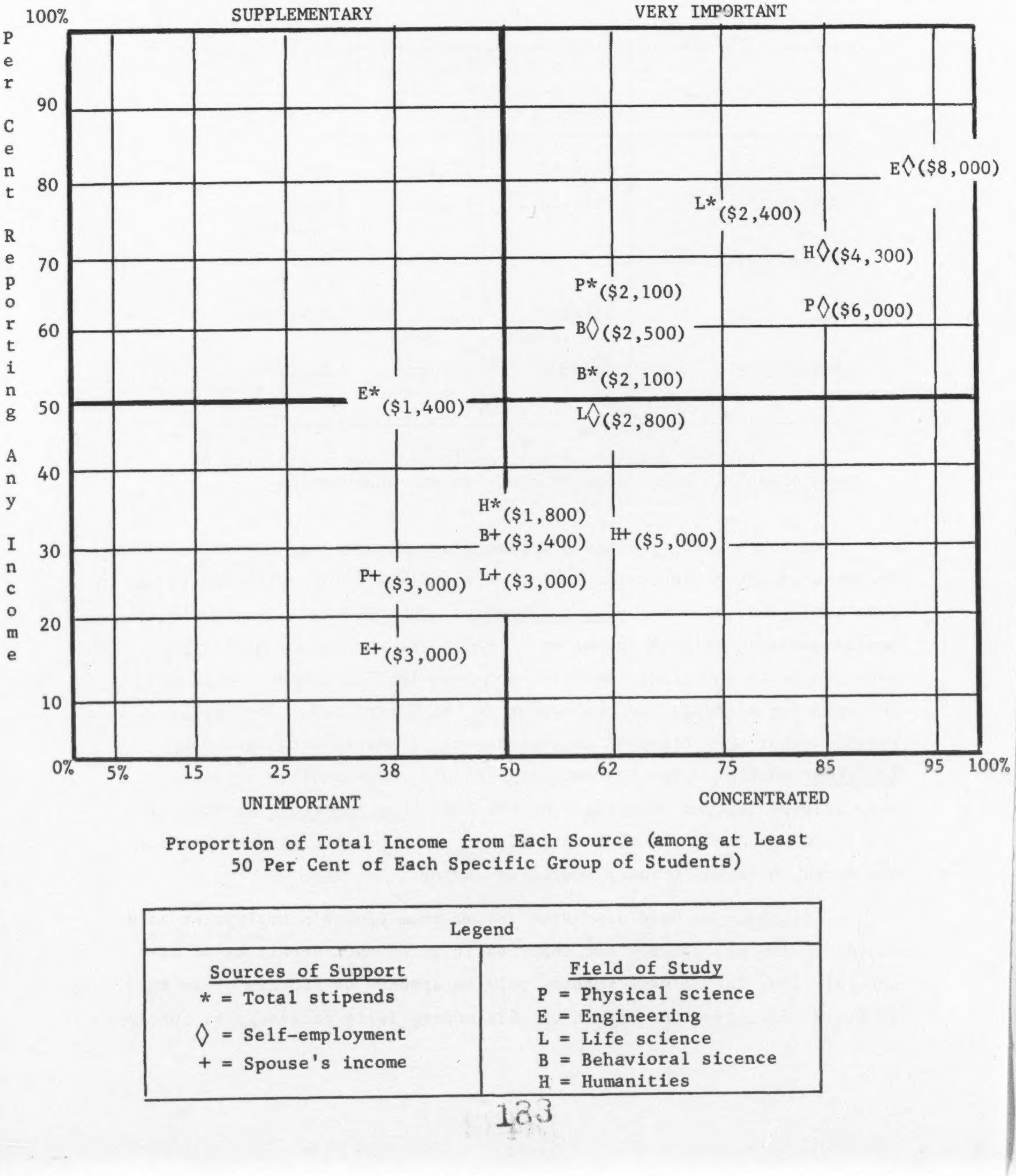
In high quality schools income from stipends was classified as the most important source of income in all five fields, although income from employment also was very important in engineering. In schools of medium quality, stipend income was found to be the single most important source in the life, physical, and behavioral sciences. This was the case for stipends and employment in the humanities. Employment ranked higher than stipends in engineering, although both were very important sources. In the remaining schools, only in life sciences were stipend sources identified as the only very important source. In all the other fields, employment, either alone or with stipend income, was found to be the primary source of support.

Although we have discussed income from spouse's employment as a source of income, we have not analyzed it in as much detail as it deserves. Thus far we have focused only on spouses as sources of income. To fully understand the effect of this source it is necessary to consider

CHART 5.5

INTENSITY OF SOURCES OF INCOME AND FIELD OF STUDY, CONTROLLING FOR QUALITY OF GRADUATE SCHOOL

c) Students Attending Group III Schools



the student's sex, marital status, and number of dependents, jointly referred to as "position in the life cycle."

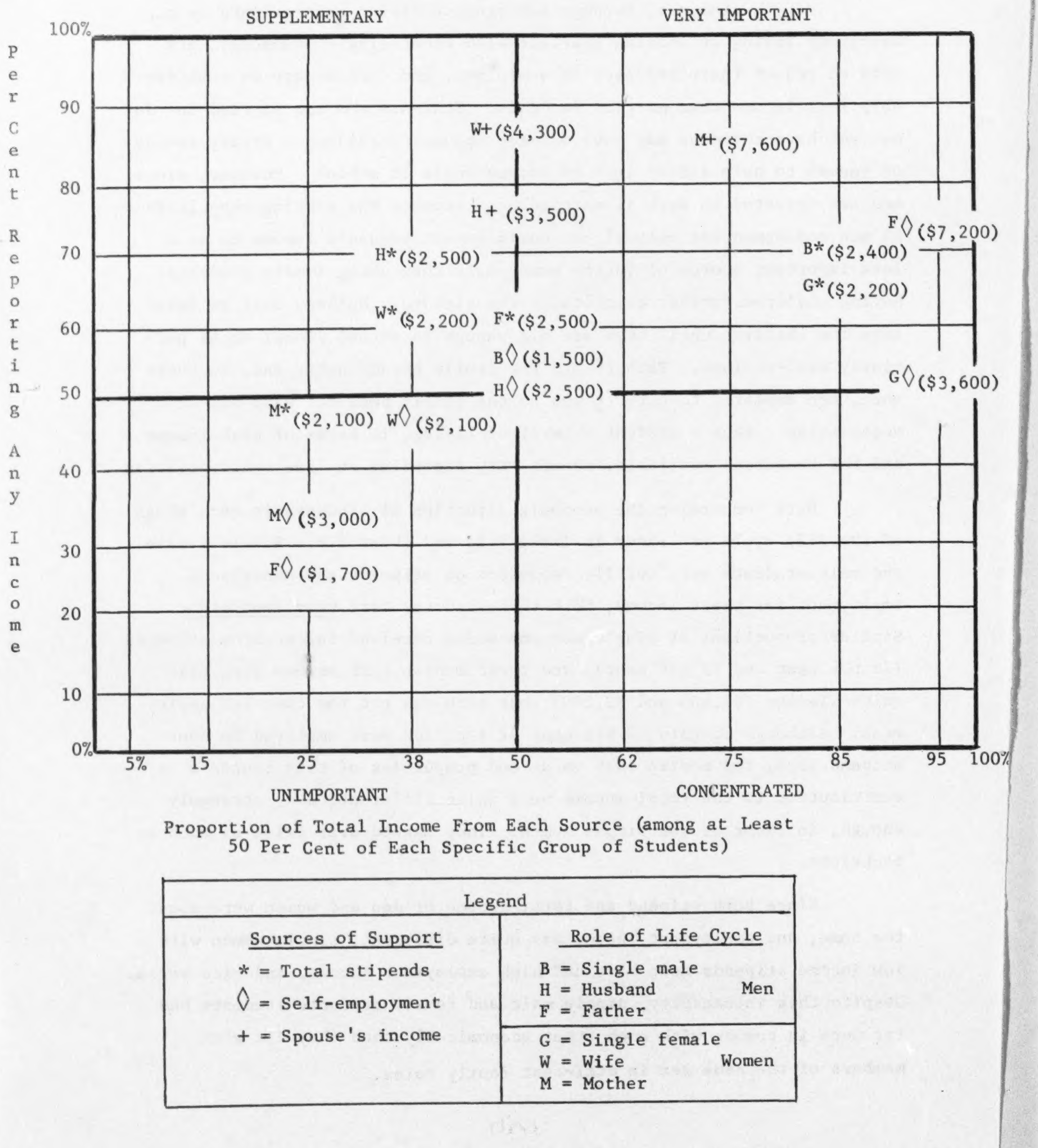
Single students, through inexpensive living arrangements (e.g., dormitory living or sharing quarters with other single students), are able to reduce their expenses to a minimum, and thus manage on considerably less income than married students. Students who are married but do not yet have children may have working spouses providing a steady source of income to help defray loss of income while in school. However, since men are expected to work if married, and because the earning capacities of men and women are unequal, we would expect spouse's income to be a less important source of income among male than among female students. Having children further complicates the picture. Mothers must at least care for children until they are old enough to attend school or be partially self-reliant. Fathers are the family breadwinners and, furthermore, are expected to earn enough so the family does not want for necessities. Thus a student's level of living, in terms of cash income and the resources available, should vary depending on life cycle position.

Data concerning the economic situation of students in each stage of the life cycle are shown in Table 5.2f and Chart 5.6. Single female and male students were heavily dependent on stipends and nonstipend employment for their income; both these sources were very important. Similar proportions of single men and women received income from stipends (72 per cent and 65 per cent), and their median cash values were also quite similar ($2,400 and $2,200), but such was not the case for employment. Although roughly 50 per cent of each sex were employed in nonstipend jobs, the median cash value and proportion of this source's contribution to the total income were quite different, and, strangely enough, in favor of the single women. They earned over twice as much as bachelors.

Since both stipend and total income of men and women were about the same, and employment income was quite different, single women with low income stipends must have had high employment income, and vice versa. Despite this incongruity, single male and female graduate students had far more in common with each other economically than they did with members of the same sex in different family roles.

CHART 5.6

INTENSITY OF SOURCES OF INCOME BY ROLE IN LIFE CYCLE



Although student husbands and wives were similar in sources of incomes and total income level, some differentiation between the two existed. Nonstipend income and income from their spouse's employment were classified as very important among husbands; among wives, this was the case only for their husband's income. Among both sexes, stipend income was supplementary. Furthermore, median incomes were quite similar. Thus student husbands and wives were economically similar except that student husbands contributed more to family income than did student wives.

In contrast to the two preceding sets of family roles, student fathers and student mothers were, economically speaking, almost polar opposites. For student mothers, graduate education seems to be a luxury based on their husband's wealth. Student wives reported a total income of $9,500, most of which came from their husband's employment. Only this source was classified as very important; the two other primary sources of income were unimportant. Median income was $2,500 less for student fathers, much closer to the median income level reported by student husbands. In contrast with the student mothers, the primary sources of support among student fathers was their nonstipend employment and stipend income. Of these two, however, the most important was nonstipend employment. Furthermore, the wives of student fathers contributed less from their employment than did mothers who were students (probably because these mothers had older children and were thus employable).

Family role, then, was an important factor in understanding the economics of graduate training. With increasing family responsibility men and women increasingly differed in the sources of income and proportions of total income derived from specific sources. The more they were involved in family responsibility, the less men were likely to be totally dependent on academic sources of income.

Summary

The median total income of graduate students enrolled for advanced degrees in spring, 1963, in five composite fields of study amounted to $5,200. Two out of three students reported stipend income; nearly six out of ten (57 per cent) secured income from nonstipend employment; and nearly three out of ten (28 per cent) also secured income from their spouse. Among those securing income from any of these sources, the data show that the median from nonstipend employment was $4,500, from spouses $3,200, and from stipends $2,400. Gifts from parents or relatives were relatively infrequent; when reported, the median dollar amount from this source was $400.

Substantial variations by field of study were shown both with respect to the proportion reporting income from any of these sources, and in the proportion of total income derived from any of these sources. Stipends and nonstipend employment were identified as the two very important sources of income on the basis of criteria developed in this chapter: stipends were very important among the sources of income of life science students, nonstipend employment among humanities students, and combinations of the two in the physical and behavioral science fields and in engineering. Variations in patterns of income were also identified when students were classified by type of first stipend held in 1962-63, level of enrollment, institutional quality of school attended, and by family role.

CHAPTER 6

EXPENSES AND LOANS

Academic and living expenses during graduate school require cash outlays. Students cannot register in school, purchase books, pay the rent, or eat without having cash. If they borrow funds to meet some or all of these expenses it implies that they expect their earning capacity after graduate school to permit repayment of loans.[1] Graduate training is considered in this chapter in terms of expenditure and loans.

Expenses were divided into two categories: academic and living. Academic expenses consist of tuition and fees, books, instruments, and thesis costs. Tuition and fees were divided into those covered by stipends and those not so covered. Nonacademic expenses consisted of the various expenses necessary for living--food, rent, health, transportation, and other general living expenses.

The first section considers academic expenses: how much students spent on academic necessities, and the degree to which stipend income played a role in meeting these expenses. The median of all academic expenses and the median tuition and fees expenses are reported as well. In the second section we consider nonacademic costs. Did students who had higher incomes spend more on food, clothing, rent, health, and transportation. The third section describes the loans students used to supplement their stipend and other income. Who borrowed money, and where, is of central concern. Did students seeking loans differ from others in academic and nonacademic characteristics? Did students borrow or did they prefer not to?

Since rates of stipend holding differed by field of study, we now ask if the same relationship holds with respect to the chances of borrowing money. Alternatively, other factors such as life role or employment could be major determinants of who borrows and how much.

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[1] See, for example, Schultz (1963).

Academic Correlates of Academic Expense

Academic Expenses

Academic expenses reported by the graduate students sampled in this survey were not great: the median was $400, and the median reported for tuition and fees was slightly less, $300 (Table 6.1). Furthermore, fully 88 per cent of the stipend-holding students reported that their stipends covered all their educational expenses. Since 66 per cent of the sample held stipends, it is safe to say that over one-half of the graduate students had all their academic expenses covered by stipends.

Cash outlays for academic expenses did not vary by field of study. However, the proportion of these expenses covered by stipends did: More than 90 per cent of the stipend holders in the physical, life, and behavioral sciences reported that their stipends covered all their academic expenses. Less than 80 per cent of the stipend holders in the engineering and humanities reported that all their academic costs were met by their stipends.

A detailed report of other academic expenses, books, instruments and supplies, and thesis preparation, was not warranted because students spent very little on academic expenses other than tuition and fees. In fact, the median cash outlay for all academic expenses other than tuition and fees was $100. The proportion of students reporting such costs, and their median value, did not vary significantly by composite field of study.

Stipend Holding: Type of First Stipend

The median figures of all academic expenses, of tuition and fees, and of the proportion of academic expenses covered by stipends, varied by stipend holding and by type of first stipend held (Table 6.1b). Fellowship students were more likely to have greater academic costs and were more likely to have all these costs covered by stipend income than other students. Students holding stipends which required duties were quite similar to fellowship holders in this respect, although the similarity was greater in the proportion of academic expenses covered by stipends than in the magnitude of academic expenses. Fellowship students spent considerably more on academic items than did students holding stipends requiring duties. Differences between fellowship holders, students holding assistantships, scholarship recipients, and students not holding stipends were fairly marked on all three indicators of academic expenses.

A somewhat surprising finding is the degree to which scholarships failed to meet all the academic expenses incurred by these students: at least half the students holding scholarships indicated that 50 per cent or less of their academic costs were met by their scholarships. Thus a majority of the scholarships held among these students did not cover a significant proportion of academic costs. This suggests that scholarships are not primarily full-time grants and are of greater significance as honorary awards. In sum, the greater the stipend income the greater the academic costs. However, the opposite was not true: high academic expenses did not necessarily mean a large stipend income.

Enrollment Status

Differences in academic expenses and in the proportion of these expenses covered by stipends were even greater when full- and part-time students were compared. The median value of all academic expenses and of tuition and fees was twice as large for full-time students ($600) as for part-time students ($300). Nearly five times as many part-time as full-time stipend holders did not have all their academic costs covered by stipend income: among stipend holders, 6 per cent of the full-time but 27 per cent of the part-time students were unable to cover all their academic expenses by means of stipends.

Stage of Study

There were no significant differences in either total academic expenses or levels of tuition and fees by stage of study. It would seem highly unlikely that academic costs would vary greatly as students progress through the system. However, there was a difference in the proportion of expenses covered by stipend income, from stage to stage. The advanced students received a greater proportion of their academic expenses from stipends than did the less advanced students. This relationship increased for each stage of study, the greatest increase

TABLE 6.1

ACADEMIC EXPENSES AND STIPEND COVERAGE OF THESE EXPENSES BY SELECTED ACADEMIC AND NONACADEMIC CHARACTERISTICS

Selected Characteristics	Median Academic Expenses	Median Tuition and Fees	Other Academic Expenses: Any (Per Cent)	Other Academic Expenses: Median	N	With Stipends Covering Less than 90 Per Cent of Academic Expenses	N	NA
a) Field of Study								
Physical science . . .	$400	$300	95	$100	1,617	9	1,194	
Engineering . .	400	300	90	100	1,328	21	803	
Life science. .	400	300	95	100	1,004	8	803	
Behavioral science . . .	400	300	97	100	1,055	8	670	
Humanities . .	400	300	95	100	932	21	431	
Total, five fields . . .	400	300	94	100	5,936	12	3,901	

N 5,936
Aliens 878
Total N . . 6,814

N 3,901
Inapplicable. 2,035
Aliens . . . 878
Total N . . 6,814

Selected Characteristics	Median Academic Expenses	Median Tuition and Fees	N	With Stipends Covering Less Than 90 Per Cent of Academic Expenses	N	NA
b) Type of Stipend Field						87
None	$300	$200	1,988	0	-	
Scholarship . . .	400	300	650	63	-	
Fellowship . . .	700	400	1,110	2	-	
Duties required .	400	300	2,101	3	-	

N 5,849
NA 87
Aliens 878
Total N 6,814

Selected Characteristics	Median Academic Expenses	Median Tuition and Fees	N	With Stipends Covering Less Than 90 Per Cent of Academic Expenses	N	NA
c) Enrollment Status						187
Full time	600	400	3,279	6	2,670	
Part time	300	200	2,470	27	1,148	

N 5,749
NA 187
Aliens 878
Total N 6,814

N 3,818
NA, inapplicable 2,118
Aliens 878
Total N . . . 6,814

TABLE 6.1--Continued

Selected Characteristics		Median Academic Expenses	Median Tuition and Fees	N	With Stipends Covering Less than 90 Per Cent of Academic Expenses	N	NA
d) Stage of Study							623
I		$400	300	2,246	17	1,338	
II		400	300	1,226	15	741	
III		500	400	709	9	548	
IV		500	300	1,132	4	956	
		N		5,313	N	3,583	
		NA		623	NA, inapplicable	2,353	
		Aliens		878	Aliens	878	
		Total N		6,814	Total N	6,814	
e) Field of Study and School Quality, School Control							
Physical sciences							
Quality	Group I	$800	$700	296	2	260	
	Group II	500	300	525	5	412	
	Group III	300	300	774	16	509	
Control	Public	400	-	936	5	745	
	Private	620	-	659	15	426	
Quality	Group I	800	700	257	10	189	
	II	500	400	418	19	276	
	Group III	300	200	633	28	332	
Control	Public	370	-	573	12	357	
	Private	640	-	735	28	437	
Life sciences							
Quality	Group I	700	600	163	3	149	
	Group II	500	300	270	5	231	
	Group III	400	300	514	13	390	
Control	Public	420	-	744	6	593	
	Private	1,060	-	203	18	163	

(Table 6.1--Continued)

TABLE 6.1--Continued

Selected Characteristics		Median Academic Expenses	Median Tuition and Fees	N	With Stipends Covering Less than 90 Per Cent of Academic Expenses	N	NA
e) Field of Study and School Quality, School Control--Continued							
Behavioral sciences							
Quality	Group I .	$800	$600	209	6	172	
	Group II .	500	300	365	5	242	
	Group III .	300	300	475	14	258	
Control	Public . .	430	-	670	6	444	
	Private . .	850	-	379	13	217	
Humanities							
Quality	Group I .	700	600	192	18	116	
	Group II	400	300	270	19	143	
	Group III	300	300	447	24	166	
Control	Public . .	390	-	531	16	245	
	Private . .	560	-	378	26	172	
			N	5,808	N	3,799	
			School inapplicable	128	Inapplicable . .	2,009	
			Aliens	878	School inapplicable	128	
			Total N	6,814	Aliens	878	
					Total	6,814	
f) Employment Status							
Unemployed		500	400	2,370	6	2,024	
Full-time employment for .	1-3 months	500	400	1,719	8	1,238	
	4-9 months	300	200	394	14	185	
	10-12 months	200	200	1,453	54	454	
			N	5,936	N	3,901	
			Aliens	878	Inapplicable .	2,035	
			Total N	6,814	Aliens	878	
					Total N . . .	6,814	

TABLE 6.1--Continued

Selected Characteristics		Median Academic Expenses	Median Tuition and Fees	N	With Stipends Covering Less than 90 Per Cent of Academic Expenses	N	NA
g) Life Cycle							131
Men	Bachelor .	$500	$400	1,758	10	1,301	
	Husband . .	500	300	1,016	10	726	
	Father . .	300	200	2,030	16	1,220	
Women	Single . .	400	300	573	14	375	
	Wife . . .	400	300	159	12	98	
	Mother . .	200	200	242	20	117	
		N		5,778	N	3,837	
		NA		131	NA, inapplicable	2,099	
		Aliens		878	Aliens	878	
		Total N . . .		6,814	Total N	6,814	

increase occurring between Stage II and Stage III. Over 95 per cent of the stipend holders in Stage IV indicated thall their academic expenses were covered by stipends compared to 83 per cent of the stipend holders in Stage I who so reported.

School Quality and Type of Institutional Control

Within each composite field, academic expenses and the proportion of academic expenses covered by stipends varied directly with institutional quality: students in Group I schools reported the greatest academic expenses and were most likely to have stipends covering these costs.

To interpret this we must consider several factors discussed in Chapters 4 and 5. Patterns of enrollment, stipend holding, and nonstipend employment as well as the median values of stipends and employment income varied by quality of school. Students in Group I schools were more likely to be enrolled full time, to hold stipends of greater value and were less likely to be employed than students in Group III schools. All these factors contribute to the differences shown in Table 6.1e.

In Group III schools one was most likely to find employed students who did not hold stipends and who were enrolled part time. In the high quality schools the typical student was a stipend holder who was not employed and who attended school as a full-time graduate student. Thus students in Group III schools were not committing as much time to study, and this was reflected in their lower academic expenses. For students in high quality schools, Academia was the most important aspect of their life; they were committed to graduate training and were devoting the majority of their time to it, and this is reflected in their higher academic expenses. This interpretation is also supported by the proportion of academic costs covered by stipends. Thus if students attended part time they paid their own academic costs; if students attend full time, academic costs were subsidized.

While field of study made little difference in total academic expenses, significant differences were found by field in the degree to which stipends covered total academic expenses. However, school quality had a persistant effect within each field of study and its relationship to the extent of coverage provided by stipends appeared to be greater than the students' composite field of study. The higher the school quality the greater the proportion of academic expenses covered by stipends (among those holding them). In high quality schools 98 per cent of the students in the physical sciences and 90 per cent of the students in engineering held stipends covering at least 90 per cent of all academic expenses; in Group III schools, 84 per cent of the physical science students and 72 per cent of those in engineering had comparable circumstances. Within each level of school quality, students in the physical, life, and behavioral sciences were most likely to hold stipends covering at least 90 per cent of their academic expenses. Also, within each field, students attending public schools had considerably lower academic expenses and had a larger proportion of their academic expenses covered by their stipends than students in private schools (Table 6.1e).

Academic costs varied considerably: Students holding fellowships or those enrolled in school on a full time basis were most likely to have larger academic expenses. Stipend coverage of at least 90 per cent of academic expenses occurred more frequently among those with advanced standing (working on doctoral thesis): among students in the physical, life, and behavioral sciences fields; and among those in a top quality school.

Thus far we have considered certain academic correlates of the pattern of academic expenses. While there were only slight differences in the dollar amounts required to meet academic expenses, there was considerable variation in the proportion of these expenses covered by stipend income. We shall now examine academic expenses in relation to certain nonacademic characteristics of graduate students.

Nonacademic Correlates of Academic Expenses

Employment Status

Employment as we have shown in Chapter 5, was a very important source of income for graduate students. It was also strongly related to the level of academic expenses: the proportion of these expenses covered by stipend income decreased as full-time employment increased. Median academic expenses of students with regular full-time employment were 60 per cent less than those of the unemployed students. Even so, well under one-half of these students who were working and who held stipends had nearly all their academic costs covered by this source, compared with 94 per cent of the unemployed students. The unemployed constituted the one group of students that did not report a difference between their total academic expenses and their tuition and fees. Students with regular full-time employment were least likely to spend money on academic purposes and were least likely to receive support for this purpose (see Table 6.1*f*).

Life Cycle

The other important area of nonacademic behavior related to the economics of graduate study was the student's position in the life cycle. Unmarried students were able to spend more on educational purposes and were able to live on less by "economizing" in ways that were not possible for married students. On the other hand, childless couples could have two incomes to live on and thus could afford the expenses involved in gaining an advanced degree without undue deprivation. Students supporting a family experienced considerable economic strain in their pursuit of advanced academic training.

Although the association was not as linear as we might expect, there was a tendency for the amount of academic expenses to decline with an increase in family responsibility for both men and women. The sharpest differences appeared when married students who did not have children were compared with those who did. The latter spent approximately half as much money on academic expenses; among those holding stipends, proportionately more failed to receive all their academic support from stipend sources. There were also differences between the sexes in each family role: men spent more on education and were more likely to hold stipends covering at least 90 per cent of their academic costs than were women. And among women, only mothers reported no difference between total academic costs and tuition and fees.

Nonacademic (Living) Expenses

There are several ways of analyzing student expenses. We would expect that the more income a student has the more he is going to spend on making himself or his family comfortable. Comfort may involve living in a better home, buying more or better food and clothes, or perhaps the purchase of a car for more convenient travel. Here we consider how students allocated their funds among the various types of living expenses.

Graduate students are similar to other adults in that almost all their income is spent on living expenses. The median figure for all living expenses was $4,200. The largest amount was for rent and food ($2,600), followed by transportation costs ($300), and health-related expenses ($200). Not all students reported expenditures for medical care: 17 per cent reported no health-related expenses between July, 1962, and June, 1963 (see Table 6.2).

Field of Study

In the previous chapter it was shown total income differed by field of study. Engineering students reported considerably higher incomes than students in other fields of study, while the latter reported

TABLE 6.2

NONACADEMIC EXPENSES BY SELECTED ACADEMIC AND NONACADEMIC CHARACTERISTICS

Selected Characteristics		Total Median Nonacademic Expenses	Major Nonacademic Expenses[a]	Transportation		Health		N
				Any (Per Cent)	Median Amount	Any (Per Cent)	Median Amount	
a) Field of Study								
Physical science .		$3,800	$2,400	93	$300	82	$200	1,617
Engineering . . .		5,800	3,500	93	500	86	200	1,328
Life science . . .		3,500	2,400	94	300	84	200	1,004
Behavioral science		3,900	2,500	91	300	86	200	1,055
Humanities		3,700	2,400	89	300	78	200	932
Total, five fields		4,200	2,600	92	300	83	200	5,936

N 5,936
Aliens 878
Total N 6,814

Selected Characteristics		Total Median Nonacademic Expenses	Major Nonacademic Expenses[a]	Transportation Any (Per Cent)	Transportation Median Amount	Health Any (Per Cent)	Health Median Amount	N
b) Stipend Holding								
None		5,400	3,200	92	400	82	200	1,988
Stipend holding	Duty free . .	4,400	,800	93	400	83	200	1,760
	Duties required	3,200	2,100	93	300	83	100	2,101

N 5,849
NA 87
Aliens 878
Total N 6,814

Selected Characteristics	Total Median Nonacademic Expenses	Major Nonacademic Expenses[a]	Transportation Any (Per Cent)	Transportation Median Amount	Health Any (Per Cent)	Health Median Amount	N
c) Enrollment Status							
Full time . . .	3,200	2,200	92	300	79	100	3,279
Part time . . .	5,600	3,300	93	400	87	200	2,470

N 5,749
NA 187
Aliens 878
Total N 6,814

(Table 6.2--Continued)

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[a] These are housing, food, beverages, personal maintenance, utility bills, etc.

TABLE 6.2--Continued

Selected Characteristics		Total Median Nonacademic Expenses	Major Nonacademic Expenses[a]	Transportation		Health		N
				Any (Per Cent)	Median Amount	Any (Per Cent)	Median Amount	
d) Stage of Study								
I		$3,600	$2,200	92	$300	80	$200	2,246
II		4,300	2,600	93	400	83	200	1,226
III		4,300	2,800	93	300	86	200	709
IV		4,300	2,800	94	400	88	200	1,132
		N			5,313			
		NA			623			
		Aliens			878			
		Total N			6,814			
e) Employment Status								
Unemployed		3,400	2,300	91	300	81	200	2,370
Employed full time for .	1-3 months	3,200	2,000	93	300	80	100	1,719
	4-9 months	4,500	2,800	91	400	83	200	394
	10-12 months. .	6,700	4,000	94	500	89	300	1,453
		N			5,936			
		Aliens			878			
		Total N			6,814			
f) Life Cycle								
Men	Bachelor	2,200	1,500	90	300	67	100	1,758
	Husband	5,000	3,000	95	400	89	200	1,016
	Father	5,800	3,700	94	400	94	300	2,030
Women	Single	2,200	1,500	89	200	78	100	573
	Wife	5,400	3,200	91	300	89	200	159
	Mother	5,000	4,500	92	500	90	400	242
		N			5,778			
		NA			131			
		Aliens			878			
		Total N			6,814			

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[a] These are housing, food, beverages, personal maintenance, utility bills, etc.

quite similar incomes. These facts are reflected in the data on living expenses.[2] Engineers reported spending substantially more on living, on food and rent, and on transportation than did students in the other fields of study, while the students in the remaining four fields did not differ in these costs. There were no significant differences by field of study in the proportions of students reporting medical expenses or in the amount of money spent on health care.

Academic Characteristics

In general, the pattern of total income was directly reflected in the amounts of money students allocated to living expenses. This is particularly true in the area of general living costs, such as rent and food. Stduents not holding stipends and those holding scholarships spent more on living expenses than did students holding fellowships or assistantships. Similarly, students enrolled part time earned and spent more than students enrolled full time. And, as we might expect, there were few differences in expenses between students at different stages of study.

Nonacademic expenses also were related to several academic characteristics of students. The largest differences occurred between holders of different types of stipends and between full- and part-time students. Both the total amounts of money spent on living and the proportion spent on the necessities of food and rent varied according to these two academic characteristics.[3] The more income students had the more likely they were to have greater living expenses, and the more likely they were to spend proportionately less of this total on "necessities."

Nonacademic Characteristics

Much the same picture emerges if we consider the employment status of these students. Living costs steadily rose as the number of months of full-time nonstipend employment increased, although students working only one to three months were very much like unemployed students. Unemployed students spent $3,400 on living, compared to $6,700 spent by students who worked full time ten to twelve months.

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[2] The spread in living expenses between engineers and other students makes sense given the high proportion of engineers studying part time and engaged in full-time employment.

[3] That is, part-time students and students without stipends showed higher levels of expenditure than full-time students and stipend recipients.

Similarly, the differences between median living expenses and those specifically for rent and food increased as the number of months of employment increased. There was a $1,100 difference between total and basic living expenses among unemployed students, a $1,200 difference among students who worked only one to three months, and a $2,700 difference between these two among students employed ten to twelve months.

The other nonacademic characteristic importantly related to the economics of graduate school was family role. The differences in living expenses and in the proportion of expenses devoted to the necessities of living were most highly accentuated here. Students who had children spent a great deal more on overall living expenses, but as compared with childless married students, the proportion for rent and food was smaller. This was also true when the married were compared with single students. The further along students were in family formation, the greater the proportion of students spending money on medical care and the more likely they were to spend larger proportions of income on health. Only 67 per cent of the single men, for example, reported health and medical care expenses with a total cash output of only $100. On the other hand, 94 per cent of the fathers spent money on health care, the median cost being $300. Although the percentages were different, the same pattern held for women.

Loans: Educational and Noneducational

Students were asked to list the sources and amounts of loans made between July, 1962, and June, 1963. Three types of loans were detailed: money from the National Defense Education Act (NDEA), other educational loans (deferred tuition, cash borrowed from the university, and all other), and noneducational loans such as installment debts, mortgages, etc. The sum of these gives the total value of all loans granted a student.

One-fifth of the students borrowed money during the period under study. The median cash value of all loans was $1,000. Although some students borrowed from more than one source, the majority borrowed from only one source (Table 6.3).

Loans were primarily nonacademic: 14 per cent borrowed a median sum of $1,000 for nonacademic purposes, compared to only 3 per cent who borrowed from NDEA and 5 per cent who borrowed from other educational agencies. Also, the median value of the loans from these sources was about one-half the amount borrowed from noneducational sources and for noneducational purposes.

Controlling for composite field of study yielded some variation in sources and amounts of loans. Engineering students borrowed more money than students in other fields and they were also more likely to borrow for noneducational purposes: 17 per cent borrowed $1,400 for noneducational uses. Educational loans were obtained more often by students in the behavioral sciences and the humanities (11 and 10 per cent, respectively) and for slightly higher median cash values. Engineering students, too, were the least likely (5 per cent) to borrow money for educational purposes.

Thus the higher the proportion of students in these fields of study borrowing from a given source, the more likely they were to borrow larger sums of money as well. There also appeared to be a slight but consistant relationship between all loans and loans for educational purposes. But cash values appeared to be inversely related: the larger the total loans were, the less likely they were to be for educational purposes.

Enrollment Status

Sources and amounts of money borrowed depended on enrollment status: Although full-time students were slightly more likely to borrow (22 compared to 19 per cent), they borrowed less money than part-time students ($800 compared to $1,100). Furthermore, they were considerably more likely to borrow money for educational purposes than students enrolled in school on a part time basis.

TABLE 6.3

FIELD OF STUDY, ENROLLMENT STATUS, AND LOANS INCURRED

(Per Cent of Stduents Reporting Any Loans Incurred
and the Median Dollar Value of These Loans)

Field and Study	Total Loans		NDEA[a] Loans		Other Education Loans		Noneducation Loans		N
	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	
a) Field of Study									
Physical science . . .	18	$ 800	3	$500	5	$ 400	13	$1,000	1,617
Engineering . .	21	1,200	1	300	4	1,000	17	1,400	1,328
Life science. .	19	800	3	400	5	600	14	1,000	1,004
Behavioral science . . .	24	1,000	4	700	7	500	12	1,600	1,055
Humanities. . .	20	800	5	600	5	400	12	1,000	932
Total, five fields. . .	20	1,000	3	400	5	500	14	1,000	5,936

N 5,936
Aliens 878
Total N 6,814

Field and Study	Total Loans Any (Per Cent)	Total Loans Median Value	NDEA[a] Loans Any (Per Cent)	NDEA[a] Loans Median Value	Other Education Loans Any (Per Cent)	Other Education Loans Median Value	Noneducation Loans Any (Per Cent)	Noneducation Loans Median Value	N
b) Enrollment Status									
Full time . . .	22	800	4	600	7	500	13	800	3,279
Part time . . .	19	1,100	2	400	3	400	16	1,400	2,470

N 5,749
NA 187
Aliens 878
Total N 6,814

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[a] National Defense Education Act.

Both enrollment status and composite field of study were associated with sources and amounts of loans. Taking both into account, the most important variable was enrollment status, although there was some difference by field of study. Within each field the median cash value of loans to part-time students was larger than that of loans made to full-time students. Full-time students were more likely to borrow from educational sources than part-time students within each field of study. Also, proportionately more full-time students in the humanities and the behavioral sciences borrowed from educational sources than did students in the other fields of study (16 and 13 per cent compared to 10 per cent for students in the remaining fields). The range in total dollar amounts and in the proportions of students borrowing varied considerably among full-time students. Eighteen per cent of the full-time students in the physical sciences borrowed a median sum of $500. In contrast, 26 per cent of the full-time engineering students borrowed a median sum of $1,000 (Table 6.4).

Other Academic Correlates

Another academic variable that could affect the incidence of loans is the presence of a stipend and the type of first stipend held. But Table 6.5a indicates this was not the case. There were few differences found between students who did and did not hold stipends: The proportions of students obtaining loans were similar as were amounts borrowed. There was a slight tendency for more stipend holders to have taken educational loans and for those without stipends to have higher dollar values for their educational loans, but these differences were small.

Type of loans taken by students was also related to stage of study: students availed themselves of educational loans in the later stages of study, especially in Stage IV, when they were working on their doctoral dissertations. A greater proportion of these students borrowed more money from educational sources than did students in the earlier stages of study (Table 6.5b).

Employment and Family Role

Throughout this report employment status and position in the life cycle were shown to influence academic behavior. Of course, employment was a primary source of income for many students. Table 6.5c shows the

TABLE 6.4

ENROLLMENT STATUS AND LOANS INCURRED, CONTROLLING FOR FIELD OF STUDY

(Per Cent of Students Reporting Any Loans Incurred
the Median Dollar Value of These Loans)

Enrollment Status	Field of Study	Loans								N
		Total Loans		NDEA Loans		Other Education Loans		Noneducation Loans		
		Any (Per Cent)	Median	Any (Per Cent)	Median	Any (Per Cent)	Median	Any (Per Cent)	Median	
Full time	Physical science .	18	$ 500	4	$500	6	$ 400	11	$ 500	955
	Engineering.	26	1,000	1	500	9	1,000	17	1,000	515
	Life science	19	700	4	500	5	700	14	900	695
	Behavioral science .	25	800	5	700	8	500	15	1,000	661
	Humanities .	22	700	7	600	9	400	11	600	448
Part time	Physical science .	19	1,000	2	600	3	400	15	1,500	606
	Engineering	18	1,700	1	300	2	500	17	1,800	771
	Life science	19	1,000	2	300	4	100	16	1,000	277
	Behavioral science .	22	1,100	2	600	4	400	18	1,300	376
	Humanities .	18	1,000	2	300	3	500	15	1,000	440

N	5,744
NA	192
Aliens	878
Total N	6,814

TABLE 6.5

SELECTED ACADEMIC AND NONACADEMIC CHARACTERISTICS AND LOANS INCURRED

(Per Cent Reporting Any Loans and the
Median Dollar Value of the Loans)

Selected Characteristics	Loans								N
	Total Loans		NDEA Loans		Other Education Loans		Noneducation Loans		
	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	
a) Stipend Holding									
None	20	$1,000	3	$700	4	$500	15	$1,200	1,988
Duty free	19	1,000	2	500	5	600	14	1,000	1,760
Assistantship . .	22	800	4	500	6	400	15	900	2,101
					N		5,849		
					NA		87		
					Aliens		878		
					Total N		6,814		
b) Stage of Study									
(Master's) Beginning I . .	20	1,000	4	500	4	400	14	1,000	2,246
II . .	21	900	3	600	5	500	16	1,100	1,226
(Doctorate) Advanced III . .	20	900	2	700	5	500	14	1,000	709
IV . .	22	900	3	500	8	600	15	1,000	1,132
					N		5,313		
					NA		623		
					Aliens		878		
					Total N		6,814		
c) Employment									
Unemployed	17	900	3	500	5	500	12	1,000	2,370
Employed full time 1-3 months	24	700	4	600	8	500	15	800	1,719
4-9 months	23	1,000	4	700	8	600	15	1,000	394
10-12 months	20	1,200	1	300	2	300	18	1,500	1,453
					N		5,936		
					Aliens		878		
					Total N		6,814		

(Table 6.5--Continued)

TABLE 6.5--Continued

Selected Characteristics		Loans								N
		Total Loans		NDEA Loans		Other Education Loans		Noneducation Loans		
		Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	Any (Per Cent)	Median Value	
d) Family Role										
Men	Bachelor.	16	$ 700	3	$500	6	$400	10	$1,000	1,758
	Husband .	22	1,000	2	500	5	400	17	1,200	1,016
	Father. . .	26	1,000	4	600	6	600	19	1,000	2,030
Women	Single. .	11	500	2	400	3	300	7	500	573
	Wife. . .	19	1,300	3	700	4	500	15	1,400	159
	Mother. .	19	1,300	2	400	2	600	15	1,500	242

N	5,778
NA	131
Aliens	878
Total N	6,814

relationship between employment status and loans.

Students who did not work full time during any part of the year or had no employment were no different from students who held full-time jobs for ten to twelve months of the year: Neither of these groups borrowed much for educational purposes, nor were they as likely to borrow as was the student who was either sporadically or occasionally employed full time. Twelve per cent of the latter students borrowed between $500 and $700 from educational agencies for educational purposes, compared with 8 per cent of the unemployed and 3 per cent of the students employed full time, who borrowed from $300 to $500 from these sources. Thus students who worked some (but not all) the time in full-time jobs were those most likely to borrow for educational purposes. Unemployed students relied on stipends, spouse's employment earnings, or independent means and therefore did not borrow as heavily as the periodically employed students. On the other hand, the students who held full-time regular jobs the year round earned enough to pay for educational costs or attended school only part time.

Family role was also important for understanding who borrowed how much and for what purposes. Table 6.5d indicates that although proportionately more men in each life cycle stage borrowed money (with one exception), women were more likely to borrow greater amounts. Among men the fathers were most likely to take loans, and they were most likely to borrow for educational purposes. Among women, the pattern was slightly different and in line with what we might expect from previous findings. Married but childless women were those most likely to borrow money to attend school. They also borrowed the most money from educational sources. On the other hand, mothers were the least likely of all students to borrow money for educational purposes. This seems quite reasonable since it was previously shown that they had substantial family incomes attributed to their husbands.

Summary

Expenses incurred by graduate students in five composite fields of study were described in this chapter. The median of expenses incurred by these students for nonacademic purposes amounted to $4,200: the major category "living expenses," such as housing, food, personal maintenance, and the like--$2,600 during the twelve-month period under study; transportation expenses were $300, and expenditures for health and medical care were $200. Academic expenses among students in these five fields of study totaled some $400; in particular tuition and fees came to $300. Full-time students spent $600 for academic purposes; part-time students, $300. The proportion of these expenses covered by a stipend varied by field of study. Academic expenses were highest among students attending high quality schools.

One out of five students secured a loan during the year; the median value of these loans was $1,000, and they came primarily from noneducational sources.

CHAPTER 7

THE DELAYED DOCTORATE

Correlates and consequences of delay in securing the doctorate on the basis of full-time uninterrupted study is the topic of this chapter. From a manpower perspective any delay in completing a program leading to the doctorate results in fewer workers with academic credentials in great demand. Hence it is useful to examine those factors that deflect students from full-time study and from completion of their program of study.

Assumptions are laid out concerning the measurement of delay and those aspects of delay that inhibit academic progress. Then attention is given to social and academic factors associated with rapid completion of degree requirements, whether different patterns of stipend support are associated with distinctive modes of delay, and the like.

The preferred design for a study of factors that contribute to delay in attaining the doctorate would be one that traces the academic and occupational careers of a cohort of college graduates over a sufficient period of time to permit all of them to have attained their ultimate academic level of attainment. An alternative had to be considered because this study was cross-sectional in design.[1]

Another limitation that must be taken into account is this: the number of calendar years a student is in graduate school has a direct bearing on the kinds of delay he experiences. Students who have just entered graduate school have not had an opportunity to change their enrollment status (from full time to part time or vice versa) or to interrupt their graduate study. Therefore the analysis presented in this chapter always takes into consideration the number of calendar years of graduate study.

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[1] "To assess these effects properly would involve following our sample of graduate students over a period of time until they had either achieved the degrees for which they were working or had definitely abandoned these aims. Graduate study being so loosely organized, . . . such a follow-up study might take more than a decade to reach the point where every one of our respondents had reached his academic destination or abandoned this career line " (Davis, 1962, p. 106).

The alternative employed here involves a comparison of the modes of delayed behavior reported by students at various stages of study. Of course, a cross-sectional study permits no inferences about changes among students at various stages of study: information is lacking about those who dropped out of graduate school during the 1963 spring term before reaching a given stage of study. But it is possible to examine those factors associated with delayed study among students at each stage of study.

The analysis in this chapter is restricted to those students who expect to receive the doctorate. Differences in requirements and in investments among those who expected the master's degree and those who expected the doctorate are many. Seventy-seven per cent of all students in the sample seek the doctorate; clearly this is the more important segment, numerically and occupationally.[2]

Assumptions Concerning the Delayed Doctorate

Delay may be measured in a number of ways: First, a student may defer the initiation of graduate study after receipt of the baccalaureate. Table 1.4 shows that 38 per cent of the sample was delayed one full year or more by virtue of this form of delay. Second, a student may be delayed by enrolling for a program of graduate studies on a part-time basis. Third, a student could delay completion of the program by dropping out of graduate school for a period of time.

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[2] Students expecting the terminal master's degree are not considered in this chapter.

On the basis of questionnaire items asking about hiatus,[3] past years of graduate study,[4] and current enrollment status,[5] four measures of delay were established: (1) postponement of graduate study after receipt of bachelor's degree; (2) first year of graduate study was part time; (3) enrolled for part-time study at some point other than the first year; (4) temporary suspension of graduate studies.

Note that the last two types of delay do not apply to students in their first year of graduate study.

Table 7.1 indicates that the majority of graduate students were not delayed on three of the four items shown. Only 10 per cent of the students enrolled more than one year had ever interrupted their studies temporarily, 31 per cent began their graduate studies as part-time students, and 28 per cent delayed a year or more in beginning their studies. But 51 per cent of those students enrolled for more than a year had not always been full-time students. Furthermore, a graduate student can be delayed in more than one of these ways, and it is necessary to determine whether being delayed in one way affects other modes of delay. This information is shown in Table 7.2.

Table 7.2 shows a positive relationship between these measures of delay; as a result, a student delayed in one way is likely to be delayed in other ways as well. For example, if a first-year student entered graduate school without delay after receiving his bachelor's degree, there was a probability of 24 per cent greater than chance that he also enrolled full time his first year in graduate school.

Table 7.2 shows that among students enrolled for more than one year the relationships between lack of delay in entering graduate schools and most other measures were quite strong. The relationships between ever interrupting studies and the other delay measures, however, were not remarkable.

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[3] Item 9: "How many calendar years elapsed between the time you received your bachelor's degree and the start of your graduate studies?"

[4] Item 10: "During which of the previous years were you enrolled for graduate study?" Note: because of multiple responses and an ambiguous time reference, the data on enrollment prior to June, 1958, were not used.

[5] The Enrollment Index was described in Chapter 3.

TABLE 7.1

FREQUENCY DISTRIBUTIONS OF THE FOUR MEASURES OF DELAY

a) Hiatus between receiving bachelor's degree and entrance into graduate school (all students eventually seeking the doctorate).

		Per Cent
Less than one year		72
One year		8
Two years		5
Three years		4
Four years or more		10
N	3,990	
NA, inapplicable	1,946	
Total N	5,936	

b) Type of enrollment during the first year in graduate school (all students seeking the doctorate).

		Per Cent
Full time		69
Part time		31
N	4,015	
NA, inapplicable	1,921	
Total N	5,936	

c) Pattern of type of enrollment while in graduate school (all doctoral degree students who have completed more than one academic year of study).

		Per Cent
Full time:		
Always		49
Mainly		14
Equally part time and full time		10
Part time:		
Always		17
Mainly		11
N	4,015	
NA, inapplicable	1,921	
Total N	5,936	

d) Interruption of graduate studies (among the same students as in panel c).

		Per Cent
Not interrupted		90
Interrupted		10
N	4,015	
NA, inapplicable	1,921	
Total N	5,936	

TABLE 7.2

RELATIONSHIPS BETWEEN DELAY ITEMS PRIOR TO AND DURING GRADUATE SCHOOL AMONG STUDENTS HAVING COMPLETED SPECIFIC AMOUNTS OF WORK IN SCHOOL (YULE'S "Q")

a)

Students who have completed less than one academic year of study

Hiatus between B.A. and graduate school was	Initial enrollment was	
	Full time	Part time
Less than one year One year or more	+.24[a] (1,555)	

b)

Students enrolled for more than one calendar year in graduate school and who have also completed more than one academic year of study

First year in school was	Enrollment pattern		Hiatus		Interrupted studies	
	Always full time	All other	None	Any	No	Yes
Full time Part time	+1.0[b] (2,846)[c]		+.51 (2,814)		+.24 (2,846)	
Enrollment pattern was Always full time All other			+.41 (2,814)		+.25 (2,846)	
Hiatus was . . . . . . Less than one year One year or more					+.24 (2,814)	

N . .	4,001
NA . .	36
Inapp.	1,899
Aliens	878
Total N. .	6,814

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[a] The number in this and the other cells is a measure of the degree of association between the two variables; it is called "Q" and was developed by Yule to measure the relationships between variables using aggregate data. It is interpreted as follows: the number in the cell is to read as the degree or amount to which knowledge of one specific variable allows or helps the analyst predict how a group of persons will behave or respond on another unit of information. It is a measure of the probability of any given person's behavior, insofar as he belongs to a group. For example, knowing a respondent's sex is very useful in predicting the probability or likelihood of a person bearing a baby or being pregnant.

[b] This "Q" must be 1.00, for if a student has always been enrolled full time he must have been a full-time student during his first year in school.

[c] The number of respondents answering both these indices or items.

(Table 7.2--Continued)

TABLE 7.2--Continued

PATTERNS OF DELAY BY CALENDAR YEARS IN GRADUATE SCHOOL

c)

Students Enrolled in their First Year of Graduate School

Hiatus	Graduate Enrollment	Per Cent	N
No	Full time	57	674
No	Part time	20	233
Yes	Full time	15	172
Yes	Part time	9	102

d)

Students Enrolled Two or More Calendar Years in Graduate School

Hiatus	First Year of Graduate Enrollment	Pattern of Graduate Enrollment	Suspended Studies	Per Cent	N
No	Full time	Full time	None	36	1,024
No	Full time	Full time	Once or more	3	74
No	Full time	Part time	None	14	391
No	Full time	Part time	Once or more	1	34
No	Part time	Part time	None	15	426
No	Part time	Part time	Once or more	2	58
Yes	Full time	Full time	None	9	256
Yes	Full time	Full time	Once or more	1	28
Yes	Full time	Part time	None	4	120
Yes	Full time	Part time	Once or more	1	25
Yes	Part time	Part time	None	13	365
Yes	Part time	Part time	Once or more	2	55

N	4,037
Inapplicable . . .	1,899
Aliens	878
Total N	6,814

Patterns of Delay

These measures of delay may be fruitfully combined into two categories: delay prior to graduate study and delay during graduate study. Table 7.3 shows the proportions of students, by year in graduate school, in terms of the pattern of delay experienced.

TABLE 7.3

PATTERN OF DELAY AND NUMBER OF CALENDAR YEARS ENROLLED IN GRADUATE SCHOOL

Calendar Years Completed	Delayed			
	Prior	During	Per Cent	N
One year	No	No	57	674
	Yes	No	15	172
	No	Yes	20	233
	Yes	Yes	9	102
Two or three years . .	No	No	42	694
	Yes	No	9	154
	No	Yes	32	539
	Yes	Yes	16	273
Four years or more . .	No	No	28	330
	Yes	No	9	102
	No	Yes	37	444
	Yes	Yes	27	320

N 4,037
Inapplicable . . . 1,899
Aliens 878
Total N 6,814

Students at each point in their graduate school career experienced different patterns of delay. The majority of first-year students (57 per cent) experienced no delay at all, and less than one out of ten first-year students (9 per cent) were delayed both prior to entrance and while in graduate school. Delay after entry was slightly more common than delay prior to entrance among these students (29 per cent compared to 24 per cent).

Second- and third-year students had different delay patterns. Less than a majority (42 per cent) reported no delay and almost two out of ten (16 per cent) were delayed both prior to and during graduate study. These students also were much more likely to be delayed during graduate school (48 per cent) rather than prior to initial graduate study (24 per cent).

Less than one-third of the most advanced students experienced no delay at all, and almost as many were delayed prior to and after entry into graduate school. Almost twice as many students in this stage experienced delays during graduate school (64 per cent) than were delayed prior to graduate school (36 per cent).[6]

Delay and Field of Study

Among first-year students, more than a majority of those in the physical, life, and behavioral sciences were not delayed, while more than a majority of the students in engineering and humanities were delayed. Students in the physical sciences were least likely to report delay prior to entry into graduate school. Approximately 25 per cent of the physical, life, and behavioral science students were delayed during graduate school, compared to between 35 and 40 per cent of the engineering and humanities students.

Furthermore, students in the humanities and engineering fields were twice as likely to be delayed both prior to and during graduate school as students in the other fields.

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[6] Doctoral students enrolled four or more years in this spring, 1963, sample represent an unknown proportion of those who started; some may have completed their program of study, others probably dropped out temporarily or permanently. Also, students in advanced stages of study may be enrolled part time because many schools stipulate that a student receiving the advanced degree be enrolled at least on a part-time basis during the term in which the degree is to be awarded. Between 6 and 12 per cent of the students working for the doctorate expected this degree in 1963 (see Table 1.11).

TABLE 7.4

COMPOSITE FIELD OF STUDY, DELAY, AND CALENDAR YEARS COMPLETED

a) Per Cent Showing Each Type of Delay

Calendar Years Completed	Delayed		Field of Study				
	Prior	During	Physical Science	Engineering	Life Science	Behavioral Science	Humanities
Less than one year	No	No	64	48	57	61	48
	Yes	No	11	13	20	14	17
	No	Yes	18	26	19	17	21
	Yes	Yes	7	13	4	7	14
N			331	188	188	269	205
Two or three years	No	No	50	32	44	45	32
	Yes	No	8	8	10	11	11
	No	Yes	29	42	30	33	30
	Yes	Yes	14	19	16	12	26
N			497	323	277	313	250
Four years or more	No	No	34	13	41	23	16
	Yes	No	8	2	13	9	10
	No	Yes	35	53	28	38	34
	Yes	Yes	22	33	17	31	40
N			368	196	239	251	142

b) Per Cent Showing Each Type of Delay (Repercentaged)

Calendar Years Completed	Delay	Field of Study				
		Physical Science	Engineering	Life Science	Behavioral Science	Humanities
Less than one year	None	64	48	57	61	48
	Prior	18	26	24	21	31
	During	25	39	23	24	35
Two or three years	None	50	32	44	45	32
	Prior	22	27	26	23	37
	During	43	61	46	45	59
Four years or more	None	34	13	41	23	16
	Prior	30	35	30	40	50
	During	57	86	45	69	74

N	4,037
Inapplicable . .	1,899
Aliens	878
Total N	6,814

Among second- and third-year students, between 44 and 50 per cent of the students in the physical, life, and behavioral sciences were not delayed at all, as compared with less than one-third of the students in humanities and engineering (32 per cent). Students in humanities were most likely to report being delayed both before entrance and during graduate school; students in the behavioral sciences, least likely.

Among students enrolled four or more years, a different pattern was evident. Forty-one per cent of the students in life science and 34 per cent of the students in physical science reported no delay, compared to only 23 per cent of the students in the behavioral science field, and between 13 and 16 per cent of the students in engineering and humanities. And, students in engineering, humanities, and behavioral science were more likely than those in physical or life science to experience both types of delay.

Stipend Holding and Delay

Since the spring, 1963, enrollment status was highly correlated with stipend holding,[7] stipend holding should be highly correlated with the measures of delay employed here.

The relationship between stipend holding and delay was examined in two ways: First patterns of stipend holding were examined among students who had different delay experiences, and second, where possible, the effects on delay in graduate school were specified among students currently holding a stipend.

Table 7.5 shows that regardless of year in graduate school, undelayed students were by far the most likely to have held stipends; students who were delayed both prior to and during graduate school were by far the least likely to report holding stipends. Also, regardless of years in graduate school, students who were delayed before entering graduate school, but not since, were more likely to have held stipends in 1962-63 than those who reported delay during but not prior to graduate school.

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[7] See Table 3.3.

Among students in their fourth year or more in graduate school, there was little difference in rate of stipend holding between those who were and were not delayed prior to graduate school (94 versus 91 per cent). This was not the case with students who were delayed during graduate school regardless of previous delay; students delayed at both times were less likely to hold stipends than the full-time, uninterrupted graduate students (51 versus 64 per cent).

Table 7.6 presents the same data given in Table 7.5, but calculated to show the history of delay comparing students according to stipend holding in 1962-63. At each level of academic progress, stipend holders had a remarkably different history of delay from that reported by those who did not have stipends.

Two-thirds (65 per cent) of first-year stipend holders never experienced delay, 20 per cent were delayed during graduate school, and only 3 per cent were delayed both prior to and during graduate school. Forty per cent of the first-year students without stipends were not delayed at all, but 46 per cent were delayed during school.

Among students who had been in graduate school longer, stipend holders were far more likely to report no delay at all and far less likely to have been delayed during school than those without stipends. Less than one-half of the stipend holders with two to three years of graduate schooling and slightly more than one-half of the most advanced stipend holders were delayed during school, compared to more than four-fifths of the two- to three-year students without stipends and almost all the most advanced students who did not have stipends.

Two explanations for the pattern in this and the preceding table come to mind. One is that holding a stipend reduced the probability that students would be delayed; and conversely, stipends were given to students who had not been delayed. To choose between these explanations would require longitudinal data from a panel study.

Delay and Type of First Stipend

Having established a pattern between stipend holding and a history of delay, we ask next whether type of stipend held was also related to

TABLE 7.5

DELAY AND STIPEND HOLDING DURING 1962-63, CONTROLLING FOR NUMBER OF CALENDAR YEARS COMPLETED

Delayed		Per Cent Holding Stipends During 1962-63		
		Calendar Years Completed in School		
Prior	During	Less than one year	Two or three years	Four years or more
No	No	80 (674)	93 (694)	94 (330)
Yes	No	66 (171)	84 (154)	91 (102)
No	Yes	62 (233)	66 (539)	64 (444)
Yes	Yes	28 (102)	52 (273)	51 (320)
NA . . .		(1)	(0)	(0)

N	4,036
NA	1
Inapplicable . .	1,899
Aliens	878
Total N	6,814

TABLE 7.6

TYPES OF DELAY AMONG STUDENTS, BY STIPEND HOLDING AND CALENDAR YEARS OF SCHOOL COMPLETED

(Per Cent)

Delay	Calendar Years and Stipend Holding					
	Less than one year		Two or three years		Four years or more	
	Stipend	None	Stipend	None	Stipend	None
None . . .	65	40	51	13	36	6
Prior . .	17	39	21	41	31	48
During . .	20	46	40	82	54	91
N . . .	829	351	1,273	387	850	346
NA . . .	1					

N	4,036
NA	1
Inapplicable . .	1,899
Aliens	878
Total N	6,814

delay. Table 7.7 shows that students experiencing different types of delay also differed in the type of first stipend held in 1962-63.

TABLE 7.7

PATTERN OF DELAY AND TYPE OF FIRST STIPEND HELD, CONTROLLING FOR CALENDAR YEARS COMPLETED

(Per Cent Holding Each Type of Stipend among Stipend Holders)

Delay		Type of First Stipend					
Prior	During	Scholarship	Fellowship	Research Assistant	Teaching Assistant	N	NA, Inapplicable
		First-Year Students					
No	No	7	38	27	29	542	132
Yes	No	16	32	26	27	114	58
No	Yes	16	10	24	50	145	88
Yes	Yes	50	11	11	29	29	73
		Second to Third-Year Students					
No	No	5	40	27	28	645	49
Yes	No	8	34	28	31	130	24
No	Yes	15	20	21	44	357	182
Yes	Yes	31	23	19	26	141	132
		Fourth to Fifth-Year Students					
No	No	2	33	45	20	309	21
Yes	No	4	35	41	20	93	9
No	Yes	16	29	34	21	285	159
Yes	Yes	24	23	27	27	163	157

N	2,953
NA	1,084
Inapplicable . .	1,899
Aliens	878
Total N	6,814

Undelayed first-year students most often held fellowships, followed by research assistantships (RA's) and teaching assistantships (TA's). Students delayed only prior to entrance held these three types of stipends more frequently than they did scholarships. Students delayed only during school most often held TA's, and those students delayed in both ways most often held scholarships. This pattern also obtained among second- and third-year graduate students.

However, this was not the case among students who were enrolled for four or more years. Students not delayed during school more often held RA's. This type of stipend was also most frequently held by students delayed only prior to graduate entrance, while students delayed in both ways were as likely to hold one as another type of stipend.

Table 7.8 shows the pattern of delay experienced by students holding different types of stipends in 1962-63. In viewing delay among various types of stipend holders, we were primarily interested in determining the association between delay during graduate school and types of stipends held, as this is the time when a stipend would be influencing delay. In general, fellowship holders were least likely to have been delayed while in school, followed by research assistants. The type of stipend most highly associated with delay during graduate training is a scholarship. Thus, among first-year students, 7 per cent of the fellows and 41 per cent of the scholars were delayed during school; among second- and third-year students, 26 per cent of the fellows and 70 per cent of the scholars were delayed during school; and, among those in school four or more years, 47 per cent and 91 per cent were so delayed.

While the interpretation of these findings is problematical, it makes more sense to think that holding a lucrative fellowship would enable a student to be undelayed. Among fourth-year students an RA might serve the same function, because these students generally work on research relevant to the thesis.

Delay and the Effects of Stipend Holding

A history of delay in graduate studies was related to field of study, stipend holding, and types of stipends held. What the students themselves have to say about the effects of having or not having a stipend is shown in Table 7.9.

Responses to a question asking about the effects of stipend holding were classified as indicating a positive or a negative effect, and a subtotal for each of these classifications was thus derived (see Table 7.9).

Students least likely to report negative effects and most likely to report positive effects were those who never were delayed, while

TABLE 7.8

TYPE OF FIRST STIPEND HELD, PATTERN OF DELAY, AND NUMBER OF CALENDAR YEARS IN SCHOOL

(Per Cent Delayed)

Type of First Stipend Held	Delay						N
	None	Prior But Not During	During But Not Prior	Both	Prior (Total)	During (Total)	
	First-Year Students						
Scholarship .	40	20	25	16	36	41	91
Fellowship . .	79	14	6	1	15	7	257
Research assistantship	68	14	17	1	15	18	209
Teaching assistantship	58	12	27	3	15	30	263
	Second to Third-Year Students						
Scholarship .	22	7	38	32	39	70	138
Fellowship . .	64	11	18	8	19	26	401
Research assistantship	56	11	24	9	20	33	309
Teaching assistantship	43	10	38	9	19	47	410
	Fourth to Fifth-Year Students						
Scholarship .	7	4	50	41	45	91	91
Fellowship . .	41	12	33	14	26	47	249
Research assistantship	44	12	30	14	26	44	310
Teaching assistantship	35	10	33	24	34	57	181

N	2,910
NA	1,127
Inapplicable . .	1,899
Aliens	878
Total N	6,814

TABLE 7.9

PERCEIVED EFFECTS OF STIPEND HOLDING DURING 1962-63, BY DELAY AND CALENDAR YEARS COMPLETED

(Per Cent Reporting an Effect among Stipend Holders)

Delayed		Effects of Holding a Stipend[a]										N	NA, Inapplicable
Prior to Graduate School	During Graduate School	Shifted Field or Thesis Topic	Attended Nonpreferred School	Enrolled Part Time	Stipend Duties Delayed Degree	Total Undesirable	Began Graduate Work Sooner	Did Preferred Research	Chose this University	Total Desirable	None		
		First-Year Students											
No	No	9	14	6	5	34	34	13	25	72	34	542	142
No	Yes	6	23	31	14	74	37	4	15	56	30	141	92
Yes	No	9	11	13	5	38	32	10	15	57	41	111	61
Yes	Yes	8	11	18	14	51	14	--	4	18	57	74	74
		Second to Third-Year Students											
No	No	5	6	5	11	27	19	23	15	57	44	631	63
No	Yes	5	7	18	16	46	21	14	11	46	44	349	190
Yes	No	8	6	11	9	34	23	15	9	47	44	127	27
Yes	Yes	5	5	17	12	39	22	9	9	40	46	138	135
		Fourth to Fifth-Year Students											
No	No	2	2	3	8	15	8	39	8	55	48	304	26
No	Yes	6	8	14	14	42	13	28	7	48	42	278	166
Yes	No	6	6	6	6	24	8	32	6	46	50	91	11
Yes	Yes	5	3	10	13	31	2	20	3	35	50	159	161

N	2,945
NA	1,092
Inapplicable . .	1,899
Aliens	878
Total N	6,814

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[a] Multiple responses were permitted.

students delayed both prior to and during graduate school were least likely to report positive effects from stipend holding. Those who were delayed at only one time were equally likely to report positive effects of stipend holding regardless of when the delay took place. The particular effects of stipend holding, however, depended on the number of years in graduate school. As years in graduate school increased, the chances increased that students would report that their stipends enabled them to do the research they really wanted.

Negative effects were reported most frequently by students delayed only during graduate school, followed by students delayed both prior to and during graduate school. The primary negative effect reported was part-time rather than full-time enrollment. Others included difficulty in getting a degree because of duties required by stipend holding and attendance at a university other than the one preferred. However, the more advanced students reported fewer negative effects of stipend holding than beginning students, suggesting that beginning students may have unrealistic expectations about stipend benefits. On the other hand, if the entering graduate student was sufficiently disappointed in the benefits of his stipend, he may have dropped out of school.

Table 7.10 shows the distribution of responses to the question asking about the effects of not having a stipend in 1962-63. As might be expected, students experiencing no delay indicated that the absence of a stipend had no effect on them. The delayed students reported that they had to enroll part time in 1963 and that they had to take a longer time to gain their degrees by working part time as a result of not holding a stipend.

A history of delayed study in graduate school was associated with field of study, stipend holding, and, among stipend holders, with type of stipend held. We now examine some academic characteristics of students classified according to type of delay experienced in graduate school.

TABLE 7.10

PATTERN OF DELAY AND PERCEIVED EFFECTS OF NOT HOLDING A STIPEND DURING 1962-63, CONTROLLING FOR CALENDAR YEARS COMPLETED

(Per Cent Reporting Effects among Students Not Holding Stipends)

Delayed		Effects of Not Holding a Stipend during 1962-63[a]							N	NA, Inapplicable
Prior to Graduate School	During Graduate School	Shift of Field or Thesis Topic	Attended Nonpreferred University	Enrolled Part Time, Preferred Full Time	Delayed Graduate Work	Temporary Dropout	Part-Time Work Delayed Degree	None		
		First-Year Students								
No	No	4	12	4	1	3	16	68	121	553
No	Yes	--	17	40	7	4	27	43	83	150
Yes	No	--	13	6	13	--	4	73	48	124
Yes	Yes	--	12	52	15	7	27	38	60	42
		Second to Third-Year Students								
No	No	--	5	5	5	2	7	7	44	650
No	Yes	2	7	33	5	3	23	23	163	376
Yes	No	--	11	5	5	--	21	21	19	135
Yes	Yes	2	11	38	14	5	20	20	123	150
		Fourth to Fifth-Year Students								
No	No	--	--	13	--	7	13	13	15	315
No	Yes	1	3	29	4	3	27	27	146	298
Yes	No	--	--	--	--	--	--	(8)	8	94
Yes	Yes	--	6	39	9	4	37	37	126	194

N	956
NA	3,081
Inapplicable . .	1,899
Aliens	878
Total N	6,814

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[a] Multiple responses were permitted.

Academic Correlates of Delay

Delay and Stage of Study

The Index of Stage of Study measured academic progress by combining the number of academic years of work completed, the degree sought, and the type of work being done. Table 7.11 shows the relationship between delay and academic progress as measured by the Stage Index.

TABLE 7.11

PATTERN OF DELAY AND STAGE OF STUDY, CONTROLLING FOR CALENDAR YEARS OF SCHOOL COMPLETED

(Per Cent of Students in Stage IV--
Currently Working on Their Dissertations)

Delay		Stage of Study	
		Calendar Years in School	
Prior	During	Two or Three Years	Four or More Years
No	No	37 (691)	85 (330)
Yes	No	26 (149)	73 (102)
No	Yes	16 (533)	53 (438)
Yes	Yes	13 (267)	41 (307)
NA . . .		(20)	(19)

N	2,817
NA	39
Inapplicable years	1,181
Inapplicable . . .	1,899
Aliens	878
Total N	6,814

Among second- and third-year students,[8] 37 per cent of the undelayed students were in Stage IV, while only 13 per cent of those delayed both prior to and during graduate study reached this stage of study.

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[8] First-year students are not shown in this table because by definition they are all in Stage I.

(Stage IV is defined as students currently engaged in dissertation work or analysis.) Among students with four or more years the pattern was much the same. Delay during graduate school was more important than delay prior to entry in determining likelihood of advanced study, and, of course, students delayed at both points were least likely (85 per cent undelayed compared to 41 per cent totally delayed students) to be in Stage IV.

Date Degree Is Expected

Another measure of the cost of delay in graduate training is the expected date of degree attainment; this measures loss of productive time. Table 7.12 shows the relationship between history of delay and expected date of completing the Ph.D.

All students, regardless of number of years enrolled, who reported no delays also expected to receive their Ph.D. sooner than students who reported being delayed both prior to and during graduate school. Looking at the effects of delay during graduate school, however, the undelayed students, regardless of number of years of enrollment, expected to get their Ph.D. more than one year earlier than the students delayed during school. Thus the average expected cost of being delayed after entering graduate school was slightly more than one year.

Institutional Correlates

In Chapter 4 (Table 4.2) school quality was seen to be an important determinant of stipend holding. The quality of the institution a student attended was also related to his history of delay, and the history of delay affected the extent of stipend holding (Table 7.13).

We previously considered the relationship between delay and composite field of study: delay was associated with field of study and the number of calendar years students were in graduate school. With one or two minor exceptions, this pattern still obtained when school quality was controlled, but the proportions of undelayed students within a given field steadily decreased as school quality decreased. Thus delay was associated with all three academic variables. For example, the proportion of undelayed students varied from a high of 77 per cent among physical science students who were in their first year and who attended schools in Group I to a low of 6 per cent among engineering students who had been in school four or more years and who attended schools in Group III.

TABLE 7.12

PATTERN OF DELAY AND MEAN MONTH AND YEAR DOCTORATE IS EXPECTED, CONTROLLING FOR CALENDAR YEARS OF SCHOOL COMPLETED

Calendar Years Completed	Delayed		Mean Month and Year Students Expect To Receive Highest Degree			
	Prior	During	Month	Year	N	NA
Less than one year . . .	No	No	August	1966	608	66
	Yes	No	November	1966	148	24
	No	Yes	June	1967	194	39
	Yes	Yes	August	1968	75	27
	---	No	August	1966	756	90
	---	Yes	October	1967	269	66
Two to three years . . .	No	No	February	1965	651	43
	Yes	No	June	1965	138	16
	No	Yes	January	1966	484	55
	Yes	Yes	October	1966	237	36
	---	No	February	1965	789	59
	---	Yes	April	1966	721	91
Four or more years . . .	No	No	April	1964	324	6
	Yes	No	January	1964	100	2
	No	Yes	October	1964	422	22
	Yes	Yes	February	1965	287	33
	---	No	November	1963	424	8
	---	Yes	January	1965	709	55

N	3,668
NA	369
Inapplicable . .	1,899
Aliens	878
Total N	6,814

TABLE 7.13

PATTERN OF DELAY, SCHOOL QUALITY, AND CALENDAR YEARS IN SCHOOL

(Per Cent Undelayed)

Calendar Years	Field of Study	School Quality		
		Group I	Group II	Group III
First year	Physical science	77 (70)	75 (103)	52 (155)
	Engineering . . .	60 (43)	48 (61)	43 (84)
	Life science . .	66 (41)	64 (44)	50 (92)
	Behavioral science	70 (50)	60 (79)	61 (137)
	Humanities . . .	56 (39)	59 (51)	40 (110)
Second to third year	Physical science	65 (109)	47 (187)	45 (194)
	Engineering . . .	46 (79)	29 (127)	25 (115)
	Life science . .	73 (45)	52 (71)	33 (147)
	Behavioral science	63 (73)	48 (113)	32 (126)
	Humanities . . .	46 (74)	26 (76)	28 (94)
Fourth year or more	Physical science	58 (80)	33 (131)	24 (153)
	Engineering . . .	33 (43)	11 (65)	6 (85)
	Life science . .	44 (55)	49 (90)	32 (84)
	Behavioral science	32 (65)	22 (105)	66 (81)
	Humanities . . .	31 (42)	11 (47)	10 (51)

N	3,968
Delay inapplicable .	1,840
School inapplicable .	128
Aliens	878
Total N	6,814

Table 7.14 considers stipend holding in terms of institutional quality and a history of delay. Generally speaking, within each level of school quality, delayed students were less likely to hold stipends than undelayed students, but the differences between delayed and undelayed students in percentages holding stipends increased as quality of school decreased. Thus delay made less difference in stipend holding among students enrolled in Group I schools than in Group III schools. However, several other facts present themselves. The proportions holding stipends were not associated with school quality among undelayed students, but the proportions holding stipends were highly associated with school quality among students experiencing delay. Thus undelayed first-year physical science students were about as likely to hold stipends whether they attended high quality or other schools; but delayed second- and third-year students in the same field were much more likely to hold stipends if they attended high quality instead of other schools.

Other Correlates of Delay

Other characteristics of graduate students are relevant for understanding delay in graduate study; in particular, current family role and nonstipend employment during the academic year 1962-63.

Table 7.15 shows how graduate students in various family roles have been delayed. Among students enrolled less than one calendar year in graduate school, single students, both men and women, were less likely to have been delayed than either married graduate students or married graduate students with children. Among graduate students enrolled four or more years, the married students without children were least likely to have been delayed.

Both male and female graduate students with family responsibilities were much more likely than students without family responsibilities to have delayed entry into graduate school and to have delayed their studies while in graduate school.

Although we do not know the point in graduate school at which family responsibilities began, students who had families to support in spring, 1963, were more likely than other graduate students to study

TABLE 7.14

COMPOSITE FIELD OF STUDY, HISTORY OF DELAY, AND SCHOOL QUALITY
(Per Cent Holding a Stipend)

Years in School	Field of Study	Not Delayed			Delayed		
		School Quality			School Quality		
		Group I	Group II	Group III	Group I	Group II	Group III
One year	Physical science . .	89 (54)	86 (77)	85 (81)	81 (16)	73 (26)	61 (74)
	Engineering	86 (26)	97 (29)	81 (36)	81 (16)	50 (32)	58 (48)
	Life science	96 (27)	86 (28)	87 (46)	[14] [14]	75 (16)	63 (46)
	Behavioral science .	86 (35)	70 (47)	69 (83)	87 (15)	59 (32)	43 (54)
	Humanities	73 (22)	67 (30)	68 (44)	47 (17)	33 (21)	39 (66)
Two to three years	Physical science . .	96 (71)	97 (88)	95 (87)	90 (38)	73 (101)	66 (107)
	Engineering	94 (36)	95 (37)	97 (29)	77 (43)	66 (90)	52 (86)
	Life science	100 (33)	100 (37)	94 (48)	[9] [12]	91 (34)	76 (99)
	Behavioral science .	91 (46)	89 (54)	90 (40)	74 (27)	68 (59)	51 (86)
	Humanities	82 (34)	80 (20)	81 (26)	55 (40)	66 (56)	35 (68)

TABLE 7.14--Continued

Years in School	Field of Study	Not Delayed			Delayed		
		School Quality			School Quality		
		Group I	Group II	Group III	Group I	Group II	Group III
Four or more years	Physical science . .	94 (46)	98 (43)	94 (36)	85 (34)	70 (88)	56 (117)
	Engineering	[14] [14]	[7] [7]	[4] [5]	69 (29)	62 (58)	54 (80)
	Life science	96 (24)	96 (44)	93 (27)	87 (21)	74 (46)	75 (57)
	Behavioral science .	95 (21)	78 (23)	[11] [13]	70 (44)	56 (82)	54 (68)
	Humanities	[13] [13]	[5] [5]	[4] [5]	72 (92)	50 (42)	35 (46)

N	3,967
Inapplicable, delay . .	1,840
NA, stipend	1
Inapplicable, school .	128
Aliens	878
Total N	6,814

part time and not to start their studies until more than one year after they had received their bachelor's degrees. The implication is that students with families were delayed due to responsibilities of parenthood.

TABLE 7.15

PATTERN OF DELAY AND FAMILY ROLE, CONTROLLING FOR CALENDAR YEAR IN SCHOOL

(Per Cent Delayed)

Calendar Years Completed	Delayed		Family Role					
			Men			Women		
	Prior	During	Bachelor	Husband	Father	Single	Wife	Mother
Less than one year	No	No	67	58	37	58	50	19
	Yes	No	8	13	31	15	12	19
	No	Yes	19	22	17	19	32	34
	Yes	Yes	5	8	15	9	6	28
N			552	186	229	128	34	32
Two to three years	No	No	52	49	31	44	28	5
	Yes	No	10	8	11	5	15	5
	No	Yes	30	33	34	34	33	35
	Yes	Yes	8	9	24	17	23	55
N			527	355	515	147	39	40
Four or more years	No	No	36	42	21	15	31	6
	Yes	No	10	11	7	9	14	9
	No	Yes	34	30	41	40	31	38
	Yes	Yes	20	16	31	37	23	47
N			255	233	560	68	22	32

N	3,954
NA	83
Inapplicable . .	1,899
Aliens	878
Total N	6,814

As for nonstipend employment, Table 7.16 shows that students delayed both prior to and during graduate school were most likely to report this form of employment during the academic year 1962-63.

TABLE 7.16

PATTERN OF DELAY AND CALENDAR YEARS IN SCHOOL

(Per Cent Reporting Nonstipend Employment and Per Cent With Regular Full-Time Job)

Calendar Years Completed	Delayed		Employment	
	Prior	During	Yes	Regular
Less than one year . . .	No	No	63 (674)	4 (426)
	Yes	No	50 (172)	9 (82)
	No	Yes	70 (233)	34 (161)
	Yes	Yes	83 (102)	69 (85)
Two to three years . . .	No	No	40 (694)	7 (271)
	Yes	No	43 (154)	14 (64)
	No	Yes	68 (539)	37 (368)
	Yes	Yes	68 (273)	60 (186)
Four or more years . . .	No	No	28 (330)	12 (89)
	Yes	No	28 (102)	14 (29)
	No	Yes	61 (444)	58 (269)
	Yes	Yes	68 (320)	61 (214)
			N . . . 4,037	N . . . 2,244
			Inapp. . 1,899	NA . . 1,793
			Aliens 878	Inapp. . 1,899
			Total 6,814	Aliens. 878
				Total 6,814

Regardless of the number of years of enrollment, students undelayed in the past were least likely to report regular full-time employment and students who were delayed both prior to and during graduate school were most likely to do so. Students delayed prior to but not during graduate school were less likely than those only delayed before entry to have been employed thirty-five hours weekly or more for ten to twelve months of the year.

Under certain circumstances employment also aids the student's professional development, although it may stretch out the time needed for the degree. Many employing organizations provide valuable training experience and career opportunities for those who have not yet completed their degrees. This is suggested by Table 7.17, which shows the proportion of students who worked at regular full-time jobs, controlling for years of enrollment, pattern of delay, and the perceived relevance of the job for the student's anticipated career.[9] Students delayed and whose jobs were the kind they wanted in their chosen field were most likely to be regularly employed. Having a job of the type desired in one's permanent career field increased the likelihood of full-time regular employment among delayed and undelayed students. The most delayed students were far more likely than all others to work regularly full time if they had the kind of jobs they wanted in their career fields.

Stipend Holding: Past and Future

We now turn to the question of stipend holding among students in this sample who were enrolled in 1961-62, the academic year preceding the period under study. Also considered here are their plans for the academic year 1963-64. Although information about the academic year 1961-62 is sparse, it contributes to an understanding of delay, and in looking at the next academic year (1963-64) we consider how past delays influenced future expectations and plans.

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[9] See Question 42-E, Appendix 4.

TABLE 7.17

PATTERN OF DELAY AND FULL-TIME, NONACADEMIC EMPLOYMENT, CONTROLLING FOR RELEVANCE OF JOB FOR CAREER AND CALENDAR YEARS COMPLETED

(Per Cent Working Regularly, 10-12 Months Per Year)

Calendar Years Completed	Delayed		Job Opportunity	
	Prior	During	Now Hold Job I Want	Do Not Now Hold Job I Want
Less than one year . . .	No	No	14 (49)	3 (370)
	Yes	No	24 (17)	5 (63)
	No	Yes	60 (42)	25 (117)
	Yes	Yes	73 (33)	65 (48)
Two to three years . . .	No	No	13 (60)	5 (207)
	Yes	No	27 (15)	8 (48)
	No	Yes	50 (133)	30 (229)
	Yes	Yes	73 (79)	50 (104)
Four or more years . . .	No	No	20 (39)	6 (50)
	Yes	No	36 (11)	0 (17)
	No	Yes	63 (152)	53 (112)
	Yes	Yes	76 (113)	46 (96)

N	2,204
NA work, inapplicable .	1,833
Inapplicable	1,899
Aliens	878
Total N	6,814

Stipend Holding, 1961-62

Stipend holding in 1961-62 among graduate students enrolled two or more years at the time of the study is shown in Table 7.18. These data also take into account length of enrollment and pattern of delay.

TABLE 7.18

PATTERN OF DELAY, CONTROLLING FOR CALENDAR YEARS COMPLETED IN SCHOOL

(Per Cent Holding Stipends during 1961-62)

Delay		Calendar Years Completed	
Prior	During	Two or three years	Four or more years
No	No	83 (683)	95 (327)
Yes	No	61 (152)	85 (101)
No	Yes	50 (528)	55 (440)
Yes	Yes	33 (265)	47 (310)

N	2,806
NA, stipend	50
Inapplicable, year .	1,181
Inapplicable, delay .	1,899
Aliens	878
Total N	6,814

As was the case during 1962-63, the undelayed students held stipends more frequently than those who had been delayed, and the longer a student had been in graduate school, the more likely he was to hold a stipend regardless of his pattern of delay. The effect of delay prior to entrance on stipend holding diminished the longer students were in school, but the effect of delay during graduate study did not.

Among current second- and third-year students, 83 per cent of the undelayed held stipends in 1961-62; so did 61 per cent of those delayed only prior to entrance; 50 per cent of the students who delayed during graduate school and only 33 per cent of those delayed at both times.

Among students who had enrolled for four or more years of graduate school at the time of the study, the comparable proportions who held stipends were 95 per cent of the undelayed and 47 per cent among those delayed both prior to and during graduate study.

Table 7.19 shows the relationship between current stipend holding and stipend holding during the academic year 1961-62. Students who were enrolled during both years and who held stipends during 1961-62 were almost without exception stipend holders again in 1962-63. More than nine out of ten stipend holders in 1961-62 were stipend holders in 1962-63: 93 per cent of those enrolled four or more years and 96 per cent of those enrolled two to three years. Among students not holding stipends in 1961-62, the relationship was not as strong: among second- and third-year students not holding a stipend in the previous year, 41 per cent currently held stipends; among students with four or more calendar years of enrollment, 28 per cent of those without stipend support in 1961-62 had it during 1962-63.

TABLE 7.19

STIPEND HOLDING DURING 1961-62 AND CALENDAR YEARS COMPLETED
(Per Cent Holding Stipends during 1962-63)

Calendar Years Completed	Stipend Holding 1961-62	
	Yes	No
Two to three years . . .	96 (1,024)	41 (549)
Four or more years . . .	93 (788)	28 (389)

N	2,750
NA, stipend	106
Inapplicable, year . .	1,181
Inapplicable, delay . .	1,899
Aliens	878
Total N	6,814

Table 7.20 shows the likelihood of reporting no delay, taking into account the stipend-holding situation during the two-year period.

Among second- and third-year students, those holding stipends in both academic years were about twice as likely to be undelayed as students holding stipends for only one of the two years, and over three and one-half times as likely to be undelayed as students who did not hold stipends in either year. The association between stipend holding and delay in graduate studies was even more pronounced among students enrolled for four or more years. Among students with only two to three years of enrollment, the proportion not delayed among those holding stipends both years was very much higher than the proportion not delayed among the students who held stipends for only one of the two years, or at neither time: 52 per cent of the students who held stipends in both years were undelayed, compared with only 6 per cent of the students who did not hold stipends in either year. These data show that the pattern of stipend holding over the two academic years, 1961-62 and 1962-63, was even more highly associated with a history of being undelayed than was stipend holding during the one academic year, 1962-63. The likelihood of uninterrupted, full-time study was highest among those holding a stipend both years and lowest among those holding a stipend neither year.

TABLE 7.20

STIPEND HOLDING DURING 1962-63, STIPEND HOLDING DURING 1961-62, AND CALENDAR YEARS OF SCHOOL COMPLETED

(Per Cent Not Delayed in School)

Calendar Years Completed	Stipend Holding 1961-62	Stipend Holding 1962-63	
		Yes	No
Two or three years . . .	Yes	66 (981)	30 (43)
	No	38 (224)	18 (325)
Four or more years . . .	Yes	52 (736)	19 (52)
	No	14 (107)	6 (282)

N	2,750
NA, stipend	106
Inapplicable, year . .	1,181
Inapplicable, delay . .	1,899
Aliens	878
Total N	6,814

Plans for 1963-64

Table 7.21 shows the relationship between the expected 1963-64 enrollment and pattern of past delay (taking into consideration number of calendar years of enrollment by the spring of 1963). By and large, the findings confirm the previous analysis. Delayed students were less likely to expect full-time enrollment than undelayed students, and students delayed only prior to graduate school were more likely to expect full-time graduate study than were students delayed during their graduate study.

TABLE 7.21

PATTERN OF DELAY, ACADEMIC EXPECTATIONS FOR 1963-64, AND CALENDAR YEARS IN SCHOOL

(Per Cent with Fall, 1963, Plans)

Calendar Years Completed	Delayed		Fall, 1963-64					N	NA
			Enrolled			Not Enrolled			
	Prior	During	Full Time	Part Time	Total	Done	Dropout		
Less than one year	No	No	75	17	94	4	4	668	6
	Yes	No	62	25	87	7	7	168	4
	No	Yes	33	61	94	3	4	232	1
	Yes	Yes	17	79	96	1	3	100	2
Two to three years	No	No	72	15	87	7	6	672	22
	Yes	No	65	19	84	9	7	150	4
	No	Yes	33	51	84	8	7	533	6
	Yes	Yes	23	65	88	7	5	270	3
Four years or more	No	No	51	13	64	33	3	317	13
	Yes	No	36	20	56	37	7	95	7
	No	Yes	25	52	77	17	6	430	14
	Yes	Yes	20	55	75	18	7	305	15

N	3,940
Next year NA, inapplicable .	97
Inapplicable	1,899
Aliens	878
Total N	6,814

As years in graduate school increased, expectations of part-time employment in 1963-64 decreased even among the most delayed students. Thus first-year graduate students were more likely to expect part-time enrollment if they had been delayed both prior to and during graduate school than were students also delayed at both times who had been enrolled a longer time.

What about students who did not expect to be enrolled in 1963-64? Students enrolled for less than four years showed little variation in the chances of completing studies, or plans for interrupting studies when history of delay is considered. However, students enrolled in graduate school for four or more years were differentiated on the basis of past delay: those experiencing any delay in the past were more likely to expect to interrupt their studies the next year than those students not delayed in the past. However, only delay during graduate school, and not prior to it, affected completion of studies. Between 33 and 37 per cent of the students not delayed since entering graduate school expected to receive their degrees in the following year, but only 17 per cent of the students who were delayed since they entered graduate school expected to finish by this time.

Table 7.22 shows the stipend holding expectation of those students who planned to be enrolled during the academic year 1963-64. Students' expectations in this realm confirm our analysis: with each increase in the number of calendar years in graduate school, the influence of delay prior to entrance lessened, and the longer students were enrolled, the more likely they were to hold stipends. Undelayed students were the most likely to expect stipends in 1963-64; and students delayed only prior to graduate enrollment were more likely than those delayed after enrollment to expect stipends; the latter, in turn, were more likely than those delayed both ways to expect stipends.

Readiness for Full-Time Study

Responses of part-time graduate students to the question "What is the least it would take to get you into graduate studies full time?" were analyzed in Chapter 3.[10] The same question is considered here for students enrolled part time in spring, 1963, in light of the experience with delay.

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[10] See Tables 3.12-3.15.

TABLE 7.22

PATTERN OF DELAY AND ANTICIPATED STIPEND HOLDING DURING 1963-64, CONTROLLING FOR CALENDAR YEARS IN SCHOOL

(Per Cent Expecting to Hold a Stipend)

Delay		Calendar Years Enrolled								
		First Year			Second to Third Year			Fourth Year or More		
Prior	During	Stipend Yes	N	NA	Stipend Yes	N	NA	Stipend Yes	N	NA
No	No	72	603	18	80	581	24	80	201	13
Yes	No	58	139	2	72	126	1	68	53	5
No	Yes	52	215	10	53	442	13	48	335	9
Yes	Yes	21	94	4	41	234	7	40	230	14

N	3,253
NA, stipend	102
NA, not enrolled . .	664
Inapplicable	1,899
Aliens	878
Total N	6,814

According to Table 7.23, only among students enrolled four or more years was there no relationship between amounts of money needed to permit full-time enrollment and delay prior to entrance. Forty-eight per cent of the first-year students not delayed prior to initiation of graduate study said that they would enroll if given $2,000 or less over their tuition. In contrast, only 29 per cent of the students delayed prior to entrance would enroll full time for a stipend of this size. Further, 23 per cent of the first-year students delayed only since entrance said that $4,000 over tuition would not be enough, but 30 per cent of those delayed both prior to and since enrollment would not go full time for this amount.

A similar pattern held among the second- and third-year students, although fewer would enroll full time for $2,000 over tuition and more would not consider tuition plus $4,000 sufficient to go full time. Students delayed only during graduate school would enroll more frequently at all levels of support for less than $4,000 than students delayed in both ways. Equal percentages of students, regardless of delay, would enroll full time for tuition plus $4,000, but proportionately more of the totally delayed said that not even this amount was enough.

TABLE 7.23

PATTERN OF DELAY AND AMOUNTS OF MONEY NEEDED TO GET STUDENTS TO ATTEND SCHOOL FULL TIME, AMONG THOSE ATTENDING PART TIME

(Per Cent)

Calendar Years Completed	Delayed		Money Needed To Go Full Time					
			Tuition Plus				N	NA
	Prior	During	$2,000	$3,000	$4,000	None		
Less than one year	No	Yes	48	19	10	23	185	48
	Yes	Yes	29	21	21	30	96	5
Two to three years	No	Yes	29	24	22	26	371	168
	Yes	Yes	24	14	22	40	210	63
Four or more years	No	Yes	14	12	28	47	287	157
	Yes	Yes	18	16	24	42	221	99

N	1,370
Inapplicable, money .	540
Not delayed	2,127
Inapplicable, delay .	1,899
Aliens	878
Total N	6,814

Among students enrolled four or more years, similar proportions reported that they would enroll full time for any given amount of stipend support. And students reporting that tuition plus $4,000 would not be enough to induce full-time enrollment were most frequently found among students enrolled four years or more.

Thus patterns of delay as well as the number of years enrolled in graduate school influenced the amounts needed to get part-time students to attend school full time. The longer part-time students were in school, and the more delayed they had been, the more money they needed and the less adequate for their needs were cash grants of up to $4,000.

Summary

This chapter focused on the relevance of stipend holding for patterns of delay among students expecting to take the doctorate. Other factors were examined which also influenced the extent to which graduate students maintained full-time, uninterrupted programs of study. A distinction was made between delay occurring before and after entry to graduate school. A majority of first-year students in the physical, life, and behavioral sciences were not delayed either way; the reverse was true among their counterparts in engineering and the humanities. In each field the extent of delay increased with number of calendar years of enrollment. Undelayed students held stipends more frequently than others; recipients of fellowships and research assistantships generally were less likely to have experienced delay than students holding other types of stipends. Delayed students expected to complete their studies for the doctorate about one year later than other students. Other correlates of delay included institutional quality, regular, full-time employment, and family roles.

CHAPTER 8

SUMMARY OF FINDINGS

This report was prepared to meet the need for information on the sources, types, and amounts of support available to graduate students, the effects of stipend holding on academic progress, and other aspects of graduate education. A summary of the detailed findings is presented in this chapter.

The Study

The report is based on a sample of graduate students enrolled in accredited degree-granting American graduate institutions during the spring term, 1963. Self-administered schedules were sent to 25,000 students enrolled for study in thirty-seven detailed fields of study, encompassing the physical sciences (11 detailed fields), life sciences (14), behavioral sciences (4), engineering (5), and humanities (2). The data are based on questionnaires completed by 20,114 graduate students sampled from 130 schools.

The text of the report and the tables accompanying the text are based on the above five composite fields. A self-weighted sub-sample was used to form these composite fields of study.

Chapter 1. Characteristics of Academic and Employment Fields

Academic Background Characteristics

1. Grade point averages achieved as undergraduates varied by composite field of study; engineering, physical sciences, and humanities recruited students with highest grade point averages.

2. After completing bachelor's degree study, a large majority of students shifted institutions for graduate study. Although this was true

of the majority of the students in each field of study, students in the physical sciences were most likely and students in engineering least likely to have shifted institutions between undergraduate and graduate work.

3. Undergraduate composite field of study was the best predictor of graduate composite field of study. Engineering and physical science students were most likely and behavioral science students least likely to have studied as undergraduates in the same composite field of study.

4. Almost two-thirds of the students entered graduate school within less than one year after completing their bachelor's degree, and, of the remaining students, a large majority entered graduate school within one to three years after receiving their undergraduate degrees. Students in the physical and behavioral sciences were least likely and students in humanities and engineering most likely to have postponed entrance to graduate study after receiving bachelor's degrees.

5. The majority of students reported being in graduate programs which permitted full-time study. However, most students were not attending school full time. About one-fifth were only working on their thesis or on research. Behavioral science students were most likely to be enrolled in full-time study programs, and those in engineering and humanities least likely to be so enrolled. As many engineering students were enrolled in night school or other programs precluding full-time study as were studying full-time.

6. Over three-quarters of the students were involved in course work as a part of their academic activities. The second most frequently mentioned academic activity was research and preparation of theses. Life science students were most likely and humanities students least likely to be working on their theses. About one-fifth of the students reported other academic activities--e.g., preparation for comprehensive language examinations.

7. A majority of students reported spending forty or more hours per week, on an average, in academic pursuits. A large majority of students in life science fields spent this amount of time, about one-half of the physical and behavioral science students did so, and less than one-half of the engineering and humanities students reported spending this amount

of time in academic activities.

8. Although approximately three-fourths of the students expected to receive their doctorate, variation by field of study was wide: Over four-fifths of the students in physical, behavioral, and life sciences compared to three-quarters of the humanities students and less than two-thirds of the engineering students aimed for the doctorate.

9. Approximately 15 per cent of the students expected to receive their degrees in 1963. By 1965 the majority within each field of study, except humanities, expected to receive them. Humanities students expected to take much longer than students in other fields of study.

10. Most students expected to acquire master's degree along the way to the doctorate, but those who did not were more likely to have continued in the same composite field in undergraduate and graduate study. Those who did not anticipate receiving master's degrees were also more likely to have switched institutions before graduate training, less likely to have had a hiatus between receipt of bachelor's degree and entrance to graduate school, and more likely to expect their doctorates at an earlier date than those who expected to receive their master's degrees as well as doctorates.

Employment Characteristics

11. The majority of students in this sample were employed in nonstipend jobs at some time during the academic year. Of the employed students, almost equal proportions were regular full-time employees (ten to twelve months) and occasional full-time employees (one to three months). Students in engineering were most likely to be employed and, if employed, to have regular full-time employment: students in the life sciences were least likely to be employed at all; and students in the life and behavioral sciences were least likely to be regularly employed full time. Sporadic full-time employment (four to nine months) was infrequent.

12. Field of employment typically coincided with composite field of study, although the relationship among engineering students was extremely high and among humanities students, relatively low.

13. The most frequently mentioned employer was a private company, followed by the college or university at which the student was enrolled. Students in engineering and physical sciences were most likely to report private companies as their employers, life science students most likely to report their colleges or universities, and the humanities students, elementary or secondary school systems.

14. Employed engineering students were more likely to be involved in jobs related to their careers and yielding peak earnings than were students in other fields of study. About 40 per cent of the students reported a peak monthly income from employment of $600 or more, the proportion varying by field of study from about three-quarters of the employed engineers to about 20 per cent of the employed humanities and life science students.

Chapter 2. Stipend Holding in American Graduate Schools

This chapter described stipend and related employment characteristics of American graduate students.

1. Field of study was the most important determinant of stipend holding. Extent of stipend holding varied from a low of 46 per cent in the humanities to a high of 80 per cent in the life sciences, with an average of 66 per cent across all fields of study. About one out of five students also held a second stipend: the frequency of these also varied by field of study.

2. Type of support within a field of study varied: fellowships and research assistantships were dominant in the life and behavioral sciences, teaching and research assistantships in the physical sciences, teaching assistantships in humanities, and scholarships in engineering. Students in the life sciences were far more likely than others to have received fellowships and research assistantships followed by students in the behavioral and physical sciences. Students in engineering and, particularly, in humanities were least likely to hold these types of stipends.

3. Over all fields, about two-thirds of all stipends came from sources other than the Federal government. The most prominent single

source was the university the student attended. Forty-five per cent reported receiving stipends from their universities. About 10 per cent of the students reported receiving stipends from each of the following sources: industrial or business corporations, the National Science Foundation, and the Public Health Service. These were the next largest sources of support. The Federal government was prominently identified with providing graduate student support in some fields but not in others. Close to one-half of the students in the life sciences held a first stipend that came from Federal agencies, as did about four out of ten of the stipend holders in the behavioral sciences, one-third in the physical sciences, three out of ten in engineering, and only one out of ten in the humanities. The second and third largest sources of support varied by field of study, discounting the college or university of attendance. Students in the physical sciences were most likely to receive support from the National Science Foundation and industrial or business corporations, students in engineering from industrial or business corporations, the life science students from one of the agencies of the Public Health Service and the National Science Foundation, the behavioral science students from the National Science Foundation, and students in humanities from state or local government.

4. Sources and types of stipends were combined and compared in each field of study. Students in all fields most commonly held university- or college-granted teaching assistantships: other frequently held stipends were university-granted research assistantships (only failing to occur with high frequency among humanities students). The remaining source-types most commonly reported were: National Institutes of Mental Health and National Science Foundation fellowships in the life sciences, National Science Foundation fellowships in the physical sciences, industrial or corporation scholarships and fellowships in engineering, National Institutes of Mental Health fellowships in the behavioral sciences, and university or college scholarships and fellowships in the humanities.

5. Cash value of all stipends held was higher in those fields of study which had a greater proportion of students holding them than they were in those fields in which the students were less likely to hold stipends. Median cash values ranged from a high of $2,700 in the life sciences to a low of $2,000 in the humanities.

6. Stduents were asked to estimate their own cumulative graduate grade point averages. In general, the higher the grade point average, the higher the proportion of students holding stipends, although the actual proportion may vary considerably with field of study. Grades made little difference among students in the life sciences and engineering fields and considerable differences among students in the behavioral sciences and humanities.

An index of academic stage of study was constructed. It was also regarded as a factor influencing stipend holding. Although stage, as well as grade point average, made considerable difference in the proportion of students receiving stipends, it, too, was not as highly assoicated with stipend holding as was field of study. When the three academic variables, field of study, stage of study, and grade point average, were combined to ascertain their joint effects on stipend holding, field of study remained the crucial determinant of levels of stipend holding, but within each field there was a distinctive pattern of stipend holding accounted for by the remaining two academic variables. For students in the life sciences, sheer academic survival almost guaranteed some form of stipend support, but for students in the behavioral sciences and humanities, grade point average continued to affect stipend holding within each stage of study.

7. In general, students were less likely to hold scholarships as they advanced academically, were more likely to hold fellowships as they moved to Stage III (doctoral work), and were also more likely to hold research assistantships in the final stage of study. The proportions of students holding teaching assistantships increased from Stage I through Stage III, but dropped again among students in Stage IV. Type of stipend most commonly held among students in Stages I and IV varied by field of study. The most common duties required of students holding stipends requiring duties were work on research directed by someone else and instruction of undergraduates. Students in engineering and life and behavioral sciences were most likely to report work on someone else's research, and humanities students most likely to undertake instruction of undergraduates. Duties of physical science students were evenly distributed.

8. Nonacademic characteristics of respondent--sex, marital status and presence of children, and employment--were associated with stipend holding. Stipend support and full-time regular employment typically operated as alternate modes of gaining income for students enrolled in graduate school. Single students were more likely than parents to hold stipends. Women were less likely to hold stipends than their male counterparts at each level of family responsibility. Although nonstipend employment was inversely related to stipend holding, variation occurred by field of study. Over 90 per cent of the unemployed life science students held stipends, compared to less than 70 per cent of the same students in the humanities.

9. A comparison between stipend holding in 1958 (based on a previous NORC study) and in 1963 revealed only slight changes. The proportions of students reporting stipends in the life and behavioral sciences were higher in 1963 and the proportions of students in the physical sciences and humanities were lower in 1963.

Chapter 3. Enrollment for Graduate Study and Stipend Support

1. Because enrollment in graduate study programs reflects the loose structure of graduate education, an index of full- and part-time enrollment was formed, using three related dimensions: programs in which full-time study was possible, relative course-loads, and average number of hours spent in academic study. Using this classification, 58 per cent of the students were engaged in full-time study during the spring term in 1963. The proportions of students enrolled full time varied by field of study; students in life sciences were most often enrolled full time and those in engineering least often.

Academic Correlates

2. Enrollment and stipend holding were highly associated--students enrolled full time were far more likely to hold stipends than those enrolled part time. However, among students enrolled full time, field of study was still a major influence on stipend holding. Life science students were most likely to hold stipends; humanities students were least likely to do so. Indeed, students in the life sciences enrolled part time were more

likely to hold stipends than humanities students who were enrolled full time.

3. Type of first stipend held varied by enrollment; students enrolled full time were more likely to hold fellowships or research assistantships, and students enrolled part time were more likely to hold scholarships or teaching assistantships. Among full-time students in each field of study, excepting the physical sciences and humanities, both fellowship and research assistantships were most prevalent. There was greater variation in stipend types by field among part-time students. In the life and behavioral sciences, research and teaching assistantships were most common; among physical science and humanities students teaching assistantships were most common; and among engineering students scholarships were most frequent.

4. Full-time students were more likely than part-time students to report Federal sources for stipend support, especially from the Public Health Service and the National Science Foundation. Part-time students were more likely than full-time students to receive stipends from non-Federal sources, from business or industrial corporations in particular. Among students enrolled full time, Federal sources varied from a high of almost 50 per cent for students in life sciences to a low of less than 5 per cent for students in humanities. Among part-time students in the same fields, exactly the opposite proportion reported non-Federal sources of stipend support.

5. With every advance in progress through graduate school (as measured by Stage of Study) the proportion of students enrolled full time increased. Students in the life and physical sciences were most likely to be enrolled full time in advanced stages and those in engineering least likely to be so enrolled in the early stages. In the later stages of study, field differences in the proportions of students enrolled full time decreased.

6. Students with high grade point averages were more likely to be enrolled full time than students of lesser academic achievement, and, although this was true in all fields, it was particularly true in humanities, engineering, and physical science. However, field differences in enrollment still persisted--students with lowest grade point averages in the life

sciences were much more likely to be enrolled full time than students with the highest averages in the humanities. Students of low academic achievement in advanced stages were more likely to be enrolled full time than those of high academic achievement in early stages. However, in the life sciences, students reported full-time enrollment at early stages of study more frequently even when they were performing below the academic level attained by a majority of their peers in other fields.

7. The best predictor of full-time enrollment was whether a graduate student held a stipend. Within each academic stage and grade point average level, rates of full-time study were at least twice as high for stipend holders than for those without stipends. Among stipend holders, however, stage of study and grade point average influenced the proportion of students enrolled full time, with the former most influential of the two.

Nonacademic Correlates

8. Bachelor men were more often enrolled full time than husbands, who in turn were more often enrolled than fathers. Single and married women were equally enrolled full time, but mothers were least likely of all groups to be so enrolled. Both field of composite study and family role were influential: within each family role category, women were less likely to be full-time students than men in that field, but all the women in the life sciences were slightly more likely to be enrolled full time than were their male counterparts in humanities and engineering.

9. Enrollment status and nonstipend employment were interdependent. Less than one-half of the students enrolled full time were employed, but about four-fifths of the part-time students were. Enrollment was also influenced by hours of work per week spent in employment. Almost none of the students enrolled full time held regular full-time jobs, but about one-half of the part-time students were so employed. Students in the life sciences were least likely to be employed at all or employed full time, whether they were part- or full-time students. Engineering students were most likely to hold jobs and to hold regular full-time jobs, whether they were part- or full-time students.

Readiness for Full-Time Study

10. In response to a question on the least amount of money it would take to get a part-time student to undertake full-time study, the majority of part-time students reported they would participate in graduate studies as full-time students for a $4,000 stipend involving no obligations plus tuition. Only 20 per cent of the part-time students reported they would consider full-time study for a $2,000 stipend with the same residual benefits. Students in engineering and physical sciences were least likely to consider attending school full time for $4,000 or less, and those in humanities and life science were most likely to find these stipends sufficient for full-time study.

11. The most important factor in addition to field of study that accounted for a part-time student's willingness to undertake full-time study for a stipend of $4,000 or less was family role. Readiness for full-time study decreased with each step into the web of family involvement. In general and within each field of study, the amount of money needed to attend school on a full-time basis increased as family involvement increased, but fathers in the humanities were more likely to attend full time for less money than fathers in engineering.

12. Students who stated that a $4,000 stipend with no obligations plus a tuition scholarship was not sufficient for full-time study were asked to explain why this was so. The primary reasons given were family or economic obligations (such as "already in debt $6,000," "house payments are too great"), an active preference for part-time study, near completion of graduate work, and the importance of on-the-job training for the student's career. The pattern of reasons given for not studying full time were most efficiently explained with reference to the graduate student's family role.

Chapter 4. Institutional Correlates of Graduate Stipends

This chapter analyzed differences in rates of stipend holding, types of stipends, stipend sources, and amounts held by students attending different types of graduate schools. The sample of students within fields of study had to be adjusted to represent schools rather than students. This refinement produced a sample of eighty-nine schools with 5,808 students.

1. Institutional variables considered to be of primary importance were quality of graduate school, whether the institution was publically or privately controlled, and size of student body enrolled at a school.

2. The proportions of students enrolled in school full time, who were farthest along in academic progress, and who had received high grades as undergraduates all varied by school quality and control. Higher quality schools had larger proportions of students attending school full time who were in advanced stages of study and who had higher grade point averages as undergraduates. Students attending high quality schools which were privately controlled were even more likely to have these academic characteristics. However, students in other private schools were less likely to be enrolled full time than students in comparable public schools. Field of study differences persisted in the proportions of students enrolled full time and in advanced stages of study; students in the life and physical sciences fared better in these respects than students in engineering and humanities.

3. Students in high quality schools were more likely to hold stipends than students in other schools. This was also true for multiple stipend holding: the higher the quality of the school, the more likely were graduate students to report having held a second or even a third stipend. In all five composite fields of study, more than six out of ten students in high quality schools held stipends; in four of the five fields, three-fourths or more of the students had at least one stipend, and one-fifth or more had two. Thus students in high quality schools were well supported.

Control and size of graduate school made almost no difference in stipend holding.

Combining both school quality and control showed that school quality made a difference in the extent to which students in the five composite fields held stipends, while control made a difference after taking quality into account. Thus students at high quality public schools usually reported the highest levels of stipend holding.

4. Except for the humanities students, students in high quality schools were more likely to hold fellowships or research assistantships and

less likely to hold scholarships or teaching assistantships than students in other schools. Among students attending public schools, the most common type of stipend was an assistantship; among students in private schools the most common type was a fellowship, except in engineering, a field providing scholarships.

Small schools more frequently provided scholarships than large schools, but large schools were more generous with assistantships. In the four science and engineering fields, students in small schools more frequently held scholarships than students in large schools, the opposite being true for humanities students.

In four of the five fields of study, students in high quality private schools held fellowships more frequently than students in high quality public schools, and students in other public schools more often held teaching assistantships than students enrolled in comparable private schools. Thus the effects of control and quality of school were additive: fellowships were more frequently held in high quality private schools and teaching assistantships in other schools.

5. Except for students in the life sciences, who were more likely to receive stipends from Federal sources if they attended public schools, there were no differences in Federal sources of stipend support. In all fields, however, students attending public schools reported stipends from their colleges or universities more often than students in private schools. Level of Federal support for students in the physical and life science fields attending high quality schools was higher than it was for students in the other fields of study.

Controlling for both school quality and type of institution, in two-thirds of the possible comparisons, private school students reported stipend support from the Federal government more frequently than did public school students. There was great variation in extent of Federal support by field of study: at one extreme, 78 per cent of the life science students in high quality private schools held Federally granted stipends, and, at the other extreme, only 2 per cent of the humanities students in these same schools held stipends from this source.

6. Students in the physical, life, and behavioral sciences who attended private schools reported stipends worth $300 more than the same students in public schools. The opposite was true for engineering students.

A direct relationship obtained between quality of graduate school and median value of all stipends held: the higher the quality of the graduate school, the higher the value of all stipends. Students in high quality schools, depending on field of study, received stipends worth $200 to $800 more than students in medium quality schools, and the students in medium quality schools received between $300 and $900 more than students in other schools.

7. Depending on field of study, students who attended high quality private schools reported stipends between $500 and $1,000 greater than those obtained by students in comparable public schools; those who attended other public schools reported stipends worth between $100 and $1,200 more than did students in comparable private schools. Dollar amounts reported as income from stipends were as follows: students in all five fields who attended high or medium quality schools received more than $2,000; in high quality schools students in physical and life sciences and in engineering fields bettered this figure by over $1,000. Indeed, except for students in the humanities, stipend recipients in high quality private schools reported stipends worth over $3,000.

Chapter 5. Sources of Income

This chapter described the sources of income of American graduate students enrolled for study during the spring of 1963.

1. Median income from all sources was $5,200. Fifty-seven per cent of the students reported income from nonstipend employment, 28 per cent from spouse's employment, and 66 per cent from all stipends held. The median cash values of these respective sources were $4,500, $3,200, and $2,400. The median cash value of gifts received from parents or relatives was relatively small, totaling $500.

2. Combining frequency of occurrence and proportional contribution to total income, stipends and employment were found to be very important sources of income and spouse's employment unimportant.

Academic Correlates

3. The importance of sources varied by field of study: stipends only were very important for students in life sciences, and only nonstipend employment was very important for students in humanities. In the other fields of study, combinations of these two sources were categorized as very important. Students in engineering were far more likely to have higher total incomes than students in the other fields. Students in the other fields were quite similar in terms of median total incomes.

4. The level and importance of sources of income varied by stipend holding and by type of first stipend held. Students not holding stipends and students holding scholarships had higher median total incomes than the other students.

Furthermore, both reported only nonstipend employment as the very important source of income. On the other hand, students holding fellowships or assistantships reported only their income from stipends as very important. Students holding assistantships had the lowest total incomes. Students holding fellowships had the most favorable situation in graduate school, both academically and financially.

5. Enrollment status was highly associated with the importance of sources of income and level of total income. Students attending school full time had stipends as their only very important source and had a median total income of $4,000, compared to part-time students, whose employment income was the only source categorized as very important and whose median total income was $7,300. Full-time students required a combination of sources to achieve their total income levels, but part-time students relied heavily on a single source for this.

6. Although total median income did not vary by stage of study, the importance of sources of income did. Stipend income was a more important source of support as stage of study advanced, while the other sources, nonstipend employment and spouse's employment, decreased in importance as students advanced. Among students in earlier stages, all three sources were classified as very important, but among students in the most advanced stage only stipends were.

7. Except among students in the life sciences, the higher the quality of the school, the lower the students' total median income. The

magnitude of this relationship varied by field, being greatest in engineering and least in behavioral sciences. The proportion of students holding stipends and the median value of all stipends held decreased as school quality declined. These relationships were least noticeable among students in the life sciences and most noticeable among students in engineering and humanities.

The relative importance of sources of income for each field of study was unaffected by school quality. At all school quality levels, more life science students received larger stipend support, and it was a more important source of income among life science students than in the other fields. However, the real or actual importance of sources of income varied considerably by field of study and school quality. In high quality schools stipend income was the most important source. In other schools, however, only in life sciences were stipends so classified in this research, while in engineering and humanities only nonstipend employment was an important source.

Nonacademic Correlates

8. Single female and male students were heavily dependent on stipend and nonstipend employment as income sources, both very important. Although their total incomes and stipend incomes were similar, single females earned twice as much as their male counterparts from nonstipend employment. Husbands and wives were similar in median cash values of their total family incomes, except that student husbands contributed more heavily to family income than did student wives. For both, spouse's employment income was very important, but only among student husbands was their own nonstipend employment categorized as very important. For student mothers, graduate education seemed to be a luxury based on their husband's income; only this source was very important, and their own stipend and employment income was classified in this study as unimportant. Student fathers had lower total median incomes than student mothers, and their primary sources of support were nonstipend employment and stipend income.

Chapter 6. Expenses and Loans

This chapter reports on some academic and nonacademic correlates of expenses and loans incurred from July 1, 1962, through June 30, 1963.

Academic Expenses

1. Total median academic expenses were $400. Of the students holding stipends, 88 per cent reported this income source covered all their academic expenses. Although academic expenses did not vary by field of study, the proportion of them covered by stipends did. Over 90 per cent of the students holding stipends in the physical, life, and behavioral sciences compared to less than 80 per cent of the engineering and humanities students reported that stipends covered academic expenses. Within each field, students attending public schools had considerably lower academic expenses and had a larger proportion of their academic expenses covered by their stipends than students attending private schools.

2. Median value of all academic expenses, of tuition and fees, and of proportions of academic expenses covered by stipends varied by stipend holding and type of first stipend held. In general, stipend income varied directly with the academic costs. Fellowship students had higher academic costs and had a higher proportion of costs covered by stipends. Although their academic expenses were less, students holding assistantships were more like fellowship holders than students holding scholarships. A majority of students holding scholarships had stipend income that failed to cover all academic expenses.

3. Median value of all academic expenses and of tuition and fees was twice as large for full-time students as for part-time students. Five times as many part-time as full-time stipend holders did not have their academic costs covered by stipend income.

4. There were no significant shifts in either total academic expenses or levels of tuition and fees by academic progress (stage of study). However, advanced students received a greater proportion of their academic expenses from stipends than less advanced students.

5. Students in high quality schools had higher academic costs, and the proportion of these costs covered by stipends was greater for these

students. Students in schools of high quality more often attended school full time, held stipends, and were unemployed. The opposite was true for students in other schools. Within each level of school quality, field of study made little difference in total academic expenses; however, differences did exist by field in the amount of coverage stipends gave to total academic expenses.

6. Students regularly employed full time had lower academic expenses and were least likely to receive support for this purpose. The opposite was true for students who were either unemployed or who were occasionally (one to three months) employed full time.

7. In general, academic expenses declined proportionately with each increase in family responsibility, especially among parents. The latter group spent about one-half as much to cover academic expenses as others. Men spent more on education and covered a greater proportion of academic costs with stipends than did women of comparable family status.

Nonacademic Expenses

8. The median of nonacademic expenses was $4,200; the largest expense was rent and food ($2,000). Seventeen per cent of the students reported no health expenses between July, 1962, and June, 1963.

9. Nonacademic expenses were related to stipend holding, types of stipends held, and enrollment status. Both the total cost of living and the proportion spent on the necessities of food and rent varied by these characteristics. The more income students had, the more likely they were to have greater living expenses, and the more likely they were to spend less of this total on "necessities."

10. Living expenses steadily rose as the number of months of full-time nonstipend employment increased, although students working only one to three months were very much like unemployed students. Also, the differences between median living expenses and those specifically for rent and food increased as the number of months of employment increased.

11. Students who were fathers or mothers spent a great deal more on overall living expenses, but rent and food were a smaller portion of

of their total expenses compared to students who were husbands or wives, and these students in turn spent more than single students.

Loans: Educational and Noneducational

12. Students identified the sources and amounts of loans incurred during the time period under study. The loan sources were the National Defense Education Act, other educational sources, and noneducational loan sources. One-fifth of the students borrowed money for a median cash value of $1,000. Most loans were noneducational; 14 per cent borrowed a median of $1,000 from noneducational sources compared to 3 per cent who borrowed from the National Defense Education Act and 5 per cent from other educational sources.

13. Engineering students borrowed more money than students in other fields and were also more likely to borrow for noneducational purposes. Educational loans were most often made by students in the behavioral sciences and the humanities.

14. Full-time students were more likely to borrow money. However, they were less likely to borrow as much, and they were far more likely to borrow for educational purposes. This pattern held within each field of study, although full-time humanities and behavioral science students were more likely than students in the other fields to borrow for educational purposes. Field of study made a greater difference in the proportions borrowing and in the amounts borrowed among students who were enrolled full time than it did among part-time students.

15. Stipend holding and type of first stipend held were not associated with the frequency, amounts, or sources of loans incurred by students in this sample.

16. Students were more likely to avail themselves of educational loans in later stages of study, especially when they were working on their doctoral dissertations.

17. Students who were unemployed during the year were very similar to students who held full-time jobs for ten to twelve months of the year: neither of these groups of students borrowed frequently or much for educational purposes, especially when compared to students who were either

occasionally or sporadically employed. Thus students who worked some (but not all) of the time at full-time nonstipend jobs were those who used loans as a source of income.

18. Although proportionately more men borrowed money, women were more likely to borrow greater amounts of money. Men were also more likely to borrow for educational purposes if they were fathers. Among women, wives were most likely to borrow money to attend school and to borrow the most money for educational purposes, while mothers were the least likely of all students to borrow money for educational purposes.

Chapter 7. The Delayed Doctorate

In this chapter an analysis is presented of the academic and non-academic correlates associated with patterns of delay among students aiming for the doctorate.

Students were classified as delayed if they postponed entry into graduate school, if they had a history of delay while in school, or if they temporarily suspended their studies. Among students enrolled for differing lengths of time, the above criteria were used to classify students as delayed prior to or after entry into graduate school.

1. As the number of calendar years of enrollment increased, students were more likely to have been delayed during their graduate training: About one-quarter of the first-year students were delayed, compared with about two-thirds of the students enrolled four or more years.

2. A majority of first-year students in the physical, life, and behavioral sciences were not delayed, but a majority of these students in the humanities and engineering were. Among students enrolled four or more years, life science students were much less likely to have been delayed, and those in the humanities and engineering were far more likely to have been delayed than other students.

3. Regardless of the number of years enrolled in school, undelayed students were by far the most likely to have held a stipend, and students delayed both prior to and during school were by far the least likely to hold them. Students who only delayed before entering were more likely to

hold stipends than students only delayed during school. Stipend holders and those without stipends were compared in their patterns of delay. Stipend holders were far less likely to have been delayed during school than those who did not have stipends, regardless of the number of years enrolled in school, and this difference was accentuated, the longer students were enrolled.

4. Among stipend holders, fellowships were held most often by undelayed students; students only delayed prior to entrance most commonly held fellowships; students only delayed while in school most commonly held teaching assistantships; and those delayed at both times most commonly held scholarships. In general, fellowship holders were those least likely to have been delayed while in school, followed by students holding research assistantships. Students holding scholarships were those most likely to have been delayed during school.

5. Delay during school was more frequent among students in early stages of study than delay prior to entry into graduate school; students delayed both prior to and during school were those least likely to have advanced standing.

6. With the exception of students enrolled four or more years, undelayed students expected to receive their degrees, on an average, two years sooner than students delayed at both times. Comparing students not delayed and delayed during school, the average difference in the length of time they expected to take to gain their degrees was slightly over one year.

7. Although life, physical, and behavioral science students were less likely to have been delayed than students in other fields of study, the proportions of these students delayed increased as school quality decreased.

8. Within each level of school quality, delayed students were less likely to hold stipends than undelayed students, but delay made less difference among students in high quality schools than in other schools. School quality made no difference in stipend holding among undelayed students, but delayed students in high quality schools were more likely to hold stipends than delayed students in other schools.

9. Both male and female graduate students with family responsibilities were much more likely than other students to have delayed entry into graduate school and to have been delayed while in graduate school.

10. Regardless of the number of years of enrollment, undelayed students and those only delayed prior to entrance were the least likely to report nonstipend employment or regular full-time jobs; students delayed in both ways were most likely to do so. Among employed students, those in jobs they wanted in their anticipated career fields were more likely to work regularly full time than other employed students.

11. Among students who had been enrolled more than one year, undelayed students were more likely to have held stipends during the previous year (1961-62) than those who had been delayed; the longer students had been in graduate school, the more likely they were to hold stipends. The effects on stipend holding of delay prior to entrance diminished the longer students were in school, but the effects of delay during graduate school did not. Almost all students who held stipends in 1961-62 held stipends in 1962-63, but some students who did not hold stipends then did so in 1962-63. Students holding stipends in both academic years were more likely to have been undelayed than students only holding stipends during one of the two years, and these students were far more likely to have been undelayed than those who did not hold stipends in either year.

APPENDIX 1

SAMPLING METHOD FOR STUDY OF FINANCES OF GRADUATE STUDENTS[1]

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[1] This Appendix was prepared by Seymour Sudman, Director of Sampling, National Opinion Research Center.

1. Sample Design

This study can best be understood as primarily intended to provide detailed information about the financial conditions of graduate students in thirty-seven separate fields. Each field was sampled at a different sampling rate so that sufficient cases would be available in each field. It should be clear that this was not intended to be an efficient sample of graduate schools as such but of the thirty-seven graduate fields of prime interest. Since different sampling methods were used for different fields, one should really describe each field separately. However, this would become too burdensome for the reader, so fields are grouped by the type of sampling used.

2. Fields with 100 Per Cent Sampling

Some fields had so few students that all students in the field were included in the sample. That is, a school which had five or more students in a field was included in the sample for this field even though it was not sampled for any other fields. Generally, these small schools were contacted by mail rather than by personal methods. The thirteen fields which were sampled at the 100 per cent rate and the sample sizes of these fields are listed below.

Field	Total Sample Size
Biophysics	282
Forestry	710
Astronomy	328
Metallurgy	245
Meteorology	356
Oceanography	234
All other physical sciences	502
General physical science	196
Anatomy	338
Genetics	438
Pathology	212
Pharmacology	323
Physiology	695

3. Engineering Fields

Five of the fields were in engineering. These fields were sampled separately. The estimated initial sample size for each of the engineering fields was set at 1,250 students to allow for separate analyses of day and evening students, as well as to allow for some nonreturned and unusable questionnaires. From the 129 universities offering graduate work in engineering, 43 selections were made, with probabilities proportionate to the total number of students (both full and part time) enrolled in the following four fields: civil, chemical, electrical, and mechanical engineering. Fourteen schools fell into the sample with certainty.[2]

The number of students and the sampling rate varied by field and school. For fourteen schools which fell into the sample with certainty, the sampling interval for each field was the total number of students enrolled in the United States in that field divided by 1,250. These sampling rates for the five fields are given below:

Chemical engineering	1:2.43
Civil engineering	1:3.14
Electrical engineering	1:9.50
Mechanical engineering	1:4.86
Other engineering	1:8.08

For the other engineering schools selected, the average sample size per school was 25. The actual sample size selected for a school was 25 times the ratio:

$$\frac{\text{Percentage of U.S. enrollment in field in School S}}{\text{Percentage of U.S. enrollment in all four fields in School S}} \cdot$$

4. Science and Humanities Fields

The sampling method for the remaining eighteen science and humanities fields was similar to that used in drawing the engineering student sample. The estimated initial sample size for each field was set at 800 to allow for a separate analysis of full-time students, if required. The selection of schools was made with probabilities proportional to total students enrolled in the biological and physical sciences and in mathematics. Seventy-two selections were made and fifteen schools fell into the sample with certainty. (Some of these schools were also in the engineering school sample.)[3]

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[2] The source of data about engineering schools was Tolliver and Armsby (1961).

For the fifteen schools that fell into this sample with certainty, the sampling interval for each field was the total number of students in the United States enrolled in that field divided by 800. These sampling rates are shown at the end of this draft.

For the other schools selected, the average sample size per school was ten. The actual sample size selected for a school was ten times the ratio:

$$\frac{\text{Percentage of U.S. enrollment in field in School S}}{\text{Percentage of U.S. enrollment in all science fields in School S}}\,.$$

For some fields, this sampling method led to total samples which were smaller than the required 800 sample. In these cases, the total sample was raised by applying a flat ratio of

$$\frac{800}{\text{Total sample initially selected}}$$

to the sample drawn at each school.

In some schools the required sample for some fields is larger than the total number of students in the fields at that school. For these schools, all graduate students in the fields are selected, and weights will be applied in tabulating the results to increase the samples at these schools to their proper size. This weighting is responsible for the 5 per cent difference between the unweighted sample size of 20,114 and the weighted sample of 21,189.

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[3] The source of data for sampling these fields was Tolliver and Sulkin (1962).

There is the possibility of growth or decline in enrollments from 1961 to 1962. Although sampling rates for each field at each school are computed based on the 1961 enrollment figures, the sample is self-adjusting for any increases or declines in enrollment.

Sampling Rates by Field for Science Schools Selected with Certainty

Agriculture	1:4.19
Biology	1:3.17
Botany	1:1.69
Zoology	1:2.85
All other biological science	1:5.25
Microbiology	1:2.46
Biochemistry	1:2.32
English	1:17.35
Geography	1:1.07
Mathematics and statistics	1:15.84
Chemistry	1:14.25
Physics	1:12.71
Geology and geophysics	1: 3.23
Psychology	1: 7.17
Anthropology	1: 1.42
Economics	1: 5.31
History	1: 9.82
Sociology	1: 3.90

5. Social Work

The same sampling procedure and the same schools that were sampled for the science and humanities fields were used to sample social work graduate students, but the overall sample size was increased to 1,100 so that a special analysis could be made of part-time students. The overall sampling rates at schools selected with certainty was 1:5.64.

6. Sampling within Schools

Where local representatives had been hired at the large schools, the sampling within schools was done locally using sampling instructions prepared in the Chicago office. Where no local representatives were hired, the entire lists of students in the required fields were obtained from the schools and the sampling was done in Chicago. In either case, a systematic sample was used. After the sampling interval had been computed, a random start was made using a random number table, and the numbers of the students to be sampled were printed using an IBM 1620 computer. These listings were then used to record the names and addresses of the students selected. A copy of the sampling instructions follows as Appendix 2.

7. Sample Execution

The total sample selected for this study consisted of 24,553 graduate students. The total number of returns received in time for processing was 20,114, or 82 per cent of those designated. Co-operation rates by field and school varied only slightly around this average of 82 per cent with the largest differences being in the smallest fields. Table A-1.1 gives the selected samples, the actual returns, and the co-operation rates by field. Table A-1.2 gives the same data by school.

Some readers may be interested in the techniques used to achieve such a high rate of return on an extremely difficult self-administered questionnaire. First, it should be pointed out that graduate students form an elite population and are better able to understand a difficult questionnaire than would be true of a sample of the general population. The major argument used to persuade this group to respond was, of course, the fact that this information was to be used by the Federal government in developing its program of financial aid to graduate students. Thus it was to the general self-interest of the group to respond.

A combination of mail, phone, personal, and telegraphic contacts was used to reach respondents. Initial contacts were by mail either from NORC's Chicago office or locally. At the large schools a special representative was hired to do the mailing and follow-up work locally. At smaller schools, both mailing and follow-up were done from Chicago.

TABLE A-1.1

CO-OPERATION RATES BY DETAILED FIELD OF STUDY

Field	Sample	Returns	Co-operation Rate
Agriculture.	756	649	86
General biology.	733	581	79
Botany	636	545	86
Zoology.	756	622	82
Microbiology	682	576	84
Biochemistry	627	554	88
Biophysics	282	236	84
Anatomy.	338	279	83
Genetics	438	394	90
Pathology.	212	167	79
Pharmacology	323	281	87
Physiology	695	569	81
All other biology.	571	499	87
Social Work.	1,105	859	78
English.	700	534	76
Forestry	710	599	84
Geography.	608	510	84
Mathematics.	720	588	82
General physical science . .	196	170	87
Astronomy.	328	278	85
Chemistry.	778	666	86
Metallurgy..	245	222	91
Meteorology.	356	291	82
Physics.	727	611	84
Geology and geophysics . . .	657	514	78
Oceanography	234	199	85
Other earth and physical science	502	327	65
Psychology	898	771	86
Anthropology	774	590	76
Economics.	1,026	822	80
History.	760	594	78
Sociology.	772	635	82
Chemical engineering	969	800	83
Civil engineering.	1,015	838	83
Electrical engineering . . .	1,231	987	80
Mechanical engineering . . .	1,220	970	80
Other engineering.	973	792	81
Gross total.	24,553	20,114	82

TABLE A-1.2

CO-OPERATION RATES BY GRADUATE SCHOOL

School	Sample	Returns	Co-operation Rate
University of Calif. (Berkeley)	1,016	791	78
University of Minnesota. . . .	797	729	91
University of Wisconsin. . . .	709	643	91
University of Michigan	670	564	84
University of Illinois	604	563	93
Ohio State University.	547	481	88
Columbia University.	527	396	75
University of California at Los Angeles	485	370	76
University of Washington . . .	483	400	83
Michigan State University of Agriculture.	460	361	78
Syracuse University.	449	337	75
University of Pennsylvania . .	448	337	75
University of North Carolina at Chapel Hill	421	316	75
Massachusetts Institute of Technology	417	334	80
Purdue University.	415	393	95
New York University.	408	283	69
Yale University.	407	331	81
University of Texas.	402	328	82
University of Maryland	382	335	88
Hunter College	380	281	74
Cornell University	361	276	76
Oregon State College	359	312	87
Polytechnic Institute of Brooklyn	359	240	67
University of Tennessee. . . .	350	295	84
Pennsylvania State University	324	302	93
The State University of Rutgers.	318	259	81
University of Oregon	313	262	84
State University of Iowa . . .	312	288	92
Catholic University of America	306	233	76
University of Chicago.	297	242	81
University of Kansas	297	264	89
Wayne State University	296	237	80
University of Missouri	294	217	74
Harvard University	290	199	69
University of Pittsburgh . . .	288	237	82
Tulane University of Louisiana	287	223	78
University of Kentucky	275	234	85
Iowa State University.	272	252	93

TABLE A-1.2--Continued

School	Sample	Returns	Co-operation Rate
Northeastern University. . .	270	223	83
Adelphi College.	266	167	63
University of Utah	266	203	76
University of Massachusetts.	255	215	84
St. Louis University	253	233	92
University of Notre Dame . .	250	202	81
Union College and University	246	165	67
Western Reserve University .	245	213	87
University of New Mexico . .	213	166	78
Okla. State Univ. of A. & A.S.	200	142	71
Case Institute of Technology	198	176	89
University of Southern California	193	143	74
University of Arizona. . . .	190	163	86
University of Cincinnati . .	188	169	90
Stanford University.	179	137	77
Brandeis University.	178	130	73
Johns Hopkins University . .	172	149	87
Louisiana State University and Agricultural and Mechanical College	158	136	86
California Institute of Technology	154	147	95
Montana State College. . . .	153	143	93
Rensselaer Polytechnic Institute.	152	117	77
Georgia Institute of Technology	149	102	68
Brown University	148	136	92
Princeton University	148	105	71
Florida State University . .	143	120	84
Newark College of Engineering	139	102	73
North Dakota Agricultural College.	137	128	93
San Francisco State College.	131	117	89
University of Houston. . . .	130	114	88
University of Mississippi. .	130	124	96
University of New Hampshire.	127	106	83
Miami University (Ohio). . .	124	99	80
University of Detroit. . . .	123	101	82
Rice University.	116	107	92
Washington University (Mo.).	109	95	87
Temple University.	108	87	81
City College of New York . .	106	68	64
University of California at Davis	103	92	89

TABLE A-1.2--Continued

School	Sample	Returns	Co-operation Rate
Drexel Institute of Technology	102	74	73
Agricultural and Mechanical College of Texas	101	85	84
Illinois Institute of Technology	97	85	88
University of Tulsa.	90	81	90
Worcester Polytechnic Institue	89	81	91
Stevens Institute of Technology	88	74	84
Colorado State University. . .	79	69	87
Auburn University.	75	61	81
Canisius College	75	54	72
University of California at La Jolla	72	67	93
Indiana State Teachers College	71	63	89
State University of Utah . . .	69	55	80
New Mexico State University of Agriculture, Engineering and Science.	65	54	83
Southern Methodist University.	63	54	86
Villanova University	61	47	77
Indiana University	59	50	85
Georgetown University.	53	40	75
Queens College	47	37	79
Louisiana Polytechnic Institute	43	34	79
Marquette University	41	30	73
The Rockefeller Institute. . .	38	29	76
St. Joseph's College	38	29	76
Ohio University.	37	31	84
Duke University.	35	33	94
University of Buffalo.	34	27	79
Texas Woman's University. . . .	33	26	79
Kansas State Teachers College.	30	30	100
Medical College of Virginia. .	30	23	77
University of Rhode Island . .	30	22	73
University of Denver	27	23	85
George Washington University .	26	21	81
Schools with sample sizes of less than 20:			
University of Idaho.	17	12	71
University of Georgia.	15	13	87
University of Miami.	14	13	93
University of Puerto Rico. . .	13	7	54
University of Florida.	13	8	62
Montana State University . . .	12	10	83

TABLE A-1.2--Continued

School	Sample	Returns	Co-operation Rate
San Jose State College	12	11	85
Drake University	11	9	82
New Mexico Institute of Mining	10	7	70
Northern Illinois University .	10	7	70
Trenton State College.	10	7	70
Indiana State College.	9	7	78
United States Naval Postgraduate School.	6	5	83
Virginia Polytechnic Institute.	6	4	67
University of Maine.	5	5	100
San Diego State College. . . .	5	4	80
Bowling Green State University	4	4	100
University of Colorado	4	3	75
Kansas State College of Pittsburg.	2	1	50
Central Missouri State College	1	0	0
Long Beach State College . . .	1	1	100
Drury College.	0	-	-
Lawrence College	0	-	-
Total, all schools. . . .	24,553	20,114	82

The personal representatives who were hired at the largest schools were trained by phone and mail. The special instructions used for these representatives follow as Appendix 2, Part B. The pay schedule used for these representatives had a bonus feature which increased the salary as the percentage completed increased.

For schools which were handled directly from Chicago, the first mailing was followed by two additional mailings to students who did not respond, the second by special delivery and the third by certified mail.

In the final month of the field operation, all refusals were handled from the Chicago office. A special night letter was telegraphed to all outstanding cases asking for their co-operation. At the same time, another copy of the questionnaire was mailed by special delivery. This night letter method was extremely successful, eliciting replies from one-third of those who had not yet responded. As a final step the departmental chairmen were asked to send night letters to nonrespondents urging them to return a completed questionnaire. This tactic was also quite effective. The chairmen also identified sampled students who were not enrolled during the study period.

8. The Self-weighted Sub-sample

The five composite fields of study were assembled as follows:

1. The 20,114 students who returned usable, completed questionnaires were weighted up to 21,189 (see paragraph 4, above, of this Appendix for an explanation of this adjustment). This is the "school-weighted N," and it is shown for each field in Column 2 of Table A-1.3. For example, the 949 electrical engineers returning questionnaires were weighted up to 1,023 cases.
2. Different sampling ratios were initially employed in setting sample sizes in each of these thirty-seven fields. Therefore the N for each field was multiplied by its field weight to arrive at a universe estimate (see column 3 of Table A-1.3).
3. This product (the universe estimate for each detailed field) was multiplied by the reciprocal of the weight for the largest field in the sample; this field was English, with a weight of 16.7 (see column 4). This procedure determined the number of cases that were to be selected from each detailed field for inclusion in the sub-sample: it established a self-weighted sub-sample of 7,016 cases.
4. An IBM 1620 computer was employed to secure this quota. Table A-1.4 shows close correspondence between the number of cases expected per composite field and the number actually extracted.

TABLE A-1.3

COMPOSITE FIELD WEIGHTING

Field	Weight (1)	School-Weighted N (2)	Product (3)	Product Multiplied by Reciprocal of 16.7 (.05988) Gives Field Quota (4)
General physical science . .	1.1	170	187.0	11.20
Other earth and physical science	1.0	327	327.0	19.58
Astronomy.	1.0	278	278.0	16.65
Chemistry.	14.4	686	9,878.4	591.52
Physics.	13.5	611	8,248.5	493.92
Geography.	1.8	659	1,186.2	71.03
Geology and geophysics . . .	3.7	574	2,123.8	127.17
Oceanography	1.0	199	199.0	11.92
Metallurgy	1.0	222	222.0	13.29
Meteorology.	1.0	291	291.0	17.42
Mathematics.	15.2	588	8,937.6	535.18
Other engineering.	10.0	796	7,960.0	476.64
Civil engineering.	3.2	937	2,998.4	179.54
Chemical engineering	2.4	949	2,277.6	136.38
Electrical engineering . . .	9.3	1,023	9,513.9	569.69
Mechanical engineering . . .	5.0	1,068	5,340.0	319.76
All other biology	3.4	550	1,870.0	111.98
Anatomy.	1.4	279	390.6	23.39
General biology.	5.0	894	4,470.0	267.66
Biochemistry	2.9	674	1,954.6	117.04
Botany	2.2	692	1,522.4	91.16
Biophysics	1.1	236	259.6	15.54
Genetics	1.1	394	433.4	25.95
Microbiology	2.2	799	1,757.8	105.26
Pathology.	1.2	167	200.4	11.99
Pharmacology	1.5	281	421.5	25.24
Physiology	1.4	569	796.6	47.70
Zoology.	3.2	695	2,224.0	133.17
Agriculture.	5.0	680	3,400.0	203.59
Forestry	1.0	599	599.0	35.87
Psychology	13.0	773	10,036.0	600.96
Anthropology	1.7	684	1,159.4	69.42
Economics.	7.2	859	6,184.8	370.35
Sociology.	4.5	659	2,965.5	177.57
English.	16.7	546	9,118.2	545.99
History.	12.1	614	7,429.4	444.87

TABLE A-1.4

NUMBER OF CASES EXPECTED AND OBSERVED IN FIVE COMPOSITE FIELDS, SELF-WEIGHTED SUB-SAMPLE

Composite Field	Expected Number of Cases	Observed Number of Cases
Physical science	1,909	1,901
Engineering.	1,683	1,684
Life science	1,215	1,245
Behavioral science	1,218	1,213
Humanities	991	985
Total	7,016	7,028

APPENDIX 2

SAMPLING INSTRUCTIONS

NATIONAL OPINION RESEARCH CENTER
University of Chicago

SAMPLING INSTRUCTIONS

A. Checking the Fields

This massive study of graduate student finances covers 37 different graduate fields at 131 universities; the expected sample size is about 25,000. Not all fields are taught at all schools. Enclosed is a "List of Fields Included" (green). From it you can determine which fields are scheduled for inclusion at your school. (According to 1961 information they were taught at your school.) Your first step is to check this green list for correctness. If you cannot find one of the fields at your school, check the following possibilities:

1. The field is listed under a different name in your school. Consult the enclosed list of field definitions to see how the field at your school should be classified.
2. The field is taught in your school, but at a different location. (For example, some biological science fields may be taught at medical schools which are in a different city.) If this is the case, notify us immediately on Form 1 so that arrangements can be made to sample at the other location.
3. The field may have been discontinued since 1961. If you discover this then no sampling for that field will be required. Let us know on Form 1.
4. If none of the above, then there is the possibility of an error either on our part or yours. Please call immediately for further instructions.

We would also like you to check carefully the enclosed green list to see whether the other fields not currently scheduled for this study are now taught at your school. If so, please notify us immediately and we will give you instructions as to how to proceed.

The information which we have about your school was obtained by the Office of Education from information supplied by your registrar's office in 1961. If you have any questions about how a field is defined we suggest that you refer to the sheet of "Field Definitions" (yellow) enclosed. When in doubt, check if you can, with the registrar who should be very familiar with these definitions. Otherwise, call us immediately. It may be useful to discuss the whole project with the registrar before you start, since he can help you avoid problems of definition. (You have received copies of the letter from the National Science Foundation to the president of your University, which may be helpful in any negotiations you have with the registrar's office.) In general, the registrar's advice will be better than that which we can give you since he is most familiar with his school. If, after discussing this with him, you still have some questions, or if the registrar is unable to help you immediately, do not hesitate to call us.

Here are some examples of problems which might arise and our suggested solutions:

1. Two or more fields which we have designated for sampling based on 1961 information have since been merged into only one field, and there are no longer any distinctions among students as to sub-field.

   Solution: Call us immediately or submit Form 1 via special delivery to tell us about the change and the number of graduate students in the new department. We will send you new sampling instructions for that field. Discard the sampling sheets for the separate fields which no longer exist.

2. You find just the opposite of example 1. A field was once taught as part of another field, but recently a new and separate department has been created.

   Solution: Sample the remaining students of the old department using the sampling sheets which we have provided. (Note that there will be fewer students than we expected, but this is O.K.) Call us and tell us about the new department and we will send you new sampling instructions for that field.

3. You find that it is possible to earn a graduate degree in a field at either the main campus or at a different campus in a distant city. (The most common example will be medical schools located away from the main campus.)

   Solution: We want to sample students on both campuses. Let us know about the other campus and we will decide whether you should contact these students or whether it should be handled by someone else.

In sum, your first step is to be sure you have defined each field at your school so you know precisely how to determine which students are included in the field and which are excluded.

Please keep in mind that students in different departments are sampled at different rates; therefore, the way that fields are defined is of great importance.

IF IN DOUBT, CALL US FOR INSTRUCTIONS, OR GIVE US A DETAILED DESCRIPTION OF THE SITUATION VIA FASTEST MAIL POSSIBLE.

B. Finding the Lists

Schools vary greatly in their methods of record keeping. These instructions can, therefore, be only suggestive. You will need to use your ingenuity to discover the easiest way of obtaining the lists of students from which to sample. Generally you are better off using central files if these are already sorted by fields or can easily be sorted. This means that the registrar's office or central files should be consulted first. If the registrar does not have the list available in a convenient way, the next step is to consult the Office of the Dean of the School in which the field you wish to sample is located. Finally, consult the Departmental or Committee files if no central record is kept. Remember that you may offer to reimburse the registrar's office for any expenses incurred.

You can see that you will save a great deal of the time and effort required to travel from one department to another as well as to contact department chairmen and secretaries if you use central files. However, if the central files are not arranged by field or study and if sorting them is a major project then you may be better off visiting the individual departments. Consider the alternatives and select the method which will be easiest for you.

Remember: You need a list--by field--of graduate students from which to sample.

C. Types of Lists

The list you receive from the registrar or other University official may be in one of a number of different forms. For example, it may simply be a typed list produced by some clerk in his office. Or it may be an IBM "printout" of the students' names and addresses. Or, it might be a file of cards--or even mailing labels.

In any event, you should make certain that the list shows the students grouped by field--e.g., all the biologists in one list, the astronomers in another list, etc. If this is absolutely impossible--that is, if the list mixes all the students together--then whatever list the registrar does give you must give the field of each student so that you may pick out the students you wish to sample among.

The form of the list is very important. Not only can you save yourself a lot of grief, but you can maintain the quality of the sample by thinking through in advance what form of list will be handiest to work with, and in what way you can avoid including students who are outside the population to be sampled.

D. Who Is Included

This study includes only currently registered graduate students. The students need not be attending full time. Evening or part-time students are to be included. Students taking no classes, but registered only for thesis research or writing are to be included

Do not include the following categories of students, however:

1. Undergraduates (even if registered for one or more graduate courses).

2. Graduate students who may still be on departmental lists but who are not currently registered for any activity. If you use central files, you will probably not find any of these students. Departmental files may include students who have not finished degree requirements, but who are not now registered for any activity. If you use departmental files, and there is no way of telling whether the student is or is not registered currently, then he should be included. The principle to follow is that when in doubt as to a student's status, the student should be included in the sample.

E. "Sampling Number Sheets"--How You Sample

For each field in the study at your school, we have sent you a Sampling Number Sheet. It tells you which students to select for the sample of that field. It provides room for you to list the name and campus address of the selected students. The Sampling Number Sheet is on two-ply IBM paper. After you have entered the sampled students' names and addresses, one copy is to be kept for your records throughout the study, while the other is to be sent to us immediately for our permanent control record. We have included a manila "Business Reply" envelope for the return of this list of students in your sample.

Make sure that the copy you send to us is legible; if at all possible, type the names and addresses. Note that you have received a packet of these Sampling Number Sheets--there is one series of numbers for each field currently planned for sampling in your school. If you enter the names and addresses of sampled students by ball-point pen, take precaution that the imprint does not pass through a number of carbons onto other sheets. You may find it convenient or necessary to unstaple the pack of Sampling Number Sheets before beginning, keeping as a unit only those pages from the same field.

At some schools there will be fields in which you are to take all students in a field (instead of sampling among them). In such instances the Sampling Number Sheet will say "Select all students in this field."

More often, however, you will find that you are to sample among the list you have received from the registrar; on the Sampling Number Sheet you will notice two columns of numbers.

The numbers in the first column are merely for your convenience and ours in counting the final sample size which you select. Do not expect that you will use up all these numbers. Based on our 1961 information from the Office of Education we boosted the 1961 enrollments by approximately 50% simply to give you sufficient sampling numbers in case a field had grown rapidly at your school. So, generally, you will be using only about 2/3 of the numbers. In a very few cases you may not have sufficient numbers. In these cases contact us immediately and we will furnish you with additional sampling numbers.

Note that if the expected sample size in a field is over 30 we have continued the series of numbers on the next sheet of the IBM paper. Always be aware that the sampling numbers within a given field may continue on the next sheet of paper.

The numbers in the second column tell you which students in a field to select, if you are not to take them all. For example, if the numbers in the second column of the Sampling Number Sheet were:

1	2
2	5
3	8
4	12
5	15
etc.	etc.

you would simply count down your list of graduate students in that field (which you had previously obtained from the registrar's office) and select for the sample the second name on the list, the fifth name, the eighth name, the twelfth name, and so on. It makes no difference what the order of the names is on the list you are using, as long as you do not arrange them so that you select individual students of your own choosing. An alphabetical listing would be one (but not the only) example of an unbiased order from which to sample.

As another example, consider the field "mathematics," which includes both mathematics and statistics, as it is defined in this study. If you first list all 80 mathematics majors and continue with all 30 statistics majors, sampling this one list of 110 names will be unbiased.

If the list contains the names of students who are to be excluded from this study, make sure you do not count them as you proceed down the list. If, by any chance, there is more than one listing for the same student be sure to count him only once.

Where you can, try to simplify your job. If IBM cards are available you should have these sorted by field and have all undergraduates (and unregistered graduate students) eliminated before you start your sampling. In some cases it might even be possible to have the sampling done by IBM equipment, but generally this will best be done manually since the sample sizes for any field are not too large.

If the list given you can actually be a series of gummed labels--which IBM equipment can produce from a file of IBM cards--you can discard the labels of those who do not fall into the sample and address the questionnaires with the labels of those students who do fall in.

F. Summary

In sum then, your sampling task falls into the following steps:

1. Identify the fields scheduled for inclusion in your school and determine the best way to gain access to a list of graduate students for each field.
2. Obtain a list of all registered graduate students in each field. This can normally be found in the registrar's office, but on some campuses it may be necessary to go to individual schools or departments.
3. Sample among the students in each field, using the two-ply "Sampling Number Sheets."
4. Record the name and campus address of each respondent on these sheets, and forward one copy to NORC. Thus we will know you have completed sampling, and we will have a permanent record of all 25,000 students in the Survey 468 sample.
5. Do not hesitate to get in touch with us. Phone calls or correspondence directed to Survey 468 will reach their destination quickly.

APPENDIX 3

SELECTED TABLES, THIRTY-SEVEN FIELDS OF STUDY

TABLE A.1

FIELD OF STUDY, CITIZENSHIP, AND STUDENT STATUS

(Per Cent)

Field of Study	Citizenship			
	American		Alien	N
	Student Status			
	Regular[a]	Special, Correspondence, Postdoctoral		
Physical Sciences				
General physical sciences . .	94	1	5	170
All other earth and physical sciences	84	3	13	327
Astronomy	86	1	13	278
Chemistry	85	2	13	686
Physics	82	3	15	611
Geography	83	1	16	659
Geology and geophysics . . .	86	2	12	574
Oceanography	85	1	14	199
Metallurgy	90	2	8	222
Meteorology	86	4	10	291
Mathematics	88	4	8	588
Engineering				
All other engineering	79	3	18	796
Civil engineering	71	1	27	937
Chemical engineering	76	1	23	949
Electrical engineering . . .	84	5	11	1,023
Mechanical engineering . . .	80	3	17	1,068
Life Sciences				
All other biology	79	-	21	550
Anatomy	85	4	11	279
General biology	90	3	7	894
Biochemistry	77	2	20	674
Botany	84	2	14	702
Biophysics	86	1	13	236
Genetics	72	1	27	394
Microbiology	83	1	16	799
Pathology	71	6	23	167
Pharmacology	81	1	18	281
Physiology	82	3	15	564
Zoology	90	1	9	695
Agriculture	70	1	29	680
Forestry	79	2	19	599
Behavioral Sciences				
Psychology	90	5	5	772
Anthropology	89	1	10	684
Economics	79	1	20	859
Sociology	85	2	14	659
Humanities				
English	94	2	4	546
History	94	2	4	614
Social Work				
Social work	93	3	4	863

[a] The remaining tables in this Appendix are for graduate students who were American citizens enrolled for advanced degrees.

TABLE B.1

FIELD OF STUDY BY MARITAL STATUS AND AGE

(Per Cent)

Field of Study	Marital Status													
	Single							Presently or Previously Married						
	Age				N	NA	Total N	Age				N	NA	Total N
	20-24	25-29	30-34	35+				20-24	25-29	30-34	35+			
Physical Sciences														
General physical sciences	34	47	16	3	32	-	32	8	34	29	29	126	1	127
All other earth and physical sciences . . .	44	44	8	4	89	-	89	15	38	25	21	183	1	184
Astronomy	58	33	7	3	107	2	109	25	45	13	17	128	-	128
Chemistry	52	39	6	3	259	3	262	23	45	18	14	315	2	317
Physics	56	36	7	1	212	1	213	19	49	20	12	283	3	286
Geography	39	40	15	5	189	2	191	8	35	26	31	353	1	354
Geology and geophysics .	56	38	5	1	171	1	172	16	50	22	13	315	4	319
Oceanography	48	42	10	-	48	-	48	10	42	30	18	118	2	120
Metallurgy	53	43	4	-	49	1	50	11	50	22	17	148	1	149
Meteorology	47	45	5	3	60	2	62	6	32	35	27	187	1	188
Mathematics	54	32	6	8	221	3	224	24	37	21	18	294	-	294
Engineering														
All other engineering . .	59	35	4	2	166	1	167	13	42	24	20	452	3	455
Civil engineering	58	33	5	3	202	-	202	18	43	22	18	460	1	461
Chemical engineering . .	65	27	5	2	286	4	290	21	52	18	9	424	3	427
Electrical engineering .	53	36	7	4	255	5	260	14	40	28	18	586	6	592
Mechanical engineering .	47	40	9	3	240	-	240	14	41	28	16	605	4	609
Life Sciences														
All other biology	36	46	10	7	148	-	148	19	39	26	17	280	2	282
Anatomy	43	33	13	12	101	-	101	16	44	23	17	136	1	137
General biology	45	36	11	7	335	3	338	14	33	17	36	460	3	463
Biochemistry	64	28	6	2	261	-	261	23	55	17	6	251	7	258
Botany	42	47	7	4	223	2	225	18	35	27	20	362	2	364
Biophysics	60	29	6	5	82	2	84	20	53	19	9	117	1	118
Genetics	49	41	8	1	94	3	97	13	46	23	17	183	2	185
Microbiology	59	28	8	5	254	1	255	17	46	18	19	403	5	408
Pathology	18	55	18	9	22	-	22	2	35	46	17	92	3	95
Pharmacology	57	29	10	5	84	-	84	13	48	24	15	142	2	144
Physiology	40	44	9	6	164	1	165	15	43	27	15	294	1	295
Zoology	51	39	6	3	247	4	251	20	44	22	14	366	4	370
Agriculture	48	42	9	2	129	1	130	14	41	29	16	340	3	343
Forestry	46	42	8	3	125	3	128	14	38	27	21	338	7	345
Behavioral Sciences														
Psychology	51	32	9	8	253	3	256	18	46	20	17	430	7	437
Anthropology	38	38	12	11	240	9	249	21	31	22	26	356	3	359
Economics	46	39	9	6	219	3	222	14	36	23	27	451	3	454
Sociology	46	27	14	13	223	2	225	13	37	22	27	329	-	329
Humanities														
English	46	30	15	9	250	6	256	17	35	18	30	255	3	258
History	45	29	17	9	273	2	275	18	42	20	20	287	4	291
Social Work														
Social work	36	34	12	18	325	2	327	12	26	13	48	458	8	466

TABLE B.2

FIELD OF STUDY BY SEX AND MARITAL STATUS

(Per Cent)

Field of Study	Sex									
	Male					Female				
	Marital Status		N	NA	Total N	Marital Status		N	NA	Total N
	Single	Married				Single	Married			
Physical Sciences										
General physical sciences	18	82	142	1	143	41	59	17	-	17
All other earth and physical sciences . . .	32	68	260	1	261	54	46	13	-	13
Astronomy	45	55	211	2	213	58	42	26	-	26
Chemistry	42	58	508	-	508	72	28	71	1	72
Physics	42	58	482	-	482	71	29	17	-	17
Geography	31	69	466	3	469	58	42	79	-	79
Geology and geophysics .	35	64	474	2	476	29	71	17	-	17
Oceanography	25	75	158	1	159	80	20	10	-	10
Metallurgy	25	75	198	1	199	-	100	1	-	1
Meteorology	24	76	244	-	244	50	50	6	-	6
Mathematics	39	61	423	-	423	63	37	95	-	95
Engineering										
All other engineering . .	27	73	619	3	622	-	100	3	-	3
Civil engineering	30	70	658	4	662	80	20	5	-	5
Chemical engineering . .	40	60	710	6	716	43	57	7	-	7
Electrical engineering .	31	69	851	8	859	-	100	1	-	1
Mechanical engineering .	28	72	846	2	848	33	67	3	1	4
Life Sciences										
All other biology	29	71	370	2	372	67	33	60	-	60
Anatomy	34	66	172	-	172	65	35	66	-	66
General biology	36	64	404	-	404	48	52	397	6	403
Biochemistry	49	51	415	2	417	57	43	104	-	104
Botany	35	65	484	3	487	53	47	105	-	105
Biophysics	39	61	184	-	184	67	33	18	1	19
Genetics	30	70	225	1	226	53	47	57	-	57
Microbiology	34	66	424	1	425	46	54	239	-	239
Pathology	14	86	109	1	110	88	12	8	-	8
Pharmacology	33	67	202	-	202	65	35	26	-	26
Physiology	30	70	376	3	379	61	39	84	1	85
Zoology	36	64	473	4	477	54	46	148	-	148
Agriculture	27	73	465	-	465	62	38	8	-	8
Forestry	27	73	469	-	469	25	75	4	-	4
Behavioral Sciences										
Psychology	33	67	489	3	492	47	53	204	2	206
Anthropology	39	61	380	1	381	45	55	228	-	228
Economics	32	68	619	2	621	39	61	57	1	58
Sociology	34	66	378	4	382	55	45	176	1	177
Humanities										
English	49	51	243	-	243	51	49	271	1	272
History	47	53	437	8	445	55	45	129	4	133
Social Work										
Social work	28	72	331	1	332	51	49	462	5	467

TABLE B.3

FIELD OF STUDY BY SEX AND AGE

(Per Cent)

Field of Study	Sex													
	Male							Female						
	Age				N	NA	Total N	Age				N	NA	Total N
	20-24	25-29	30-34	35+				20-24	25-29	30-34	35+			
Physical Sciences														
General physical sciences	13	37	28	23	141	2	143	17	35	12	35	17	-	17
All other earth and physical sciences . . .	24	40	20	16	260	1	261	38	38	15	8	13	-	13
Astronomy	38	40	10	11	210	3	213	54	31	8	8	26	-	26
Chemistry	34	45	14	8	504	4	508	53	26	4	17	70	2	72
Physics	34	44	14	8	479	3	482	44	25	25	6	16	1	17
Geography	16	39	25	20	463	6	469	37	24	8	32	79	-	79
Geology and geophysics .	29	46	16	9	469	7	476	41	24	29	6	17	-	17
Oceanography	18	43	25	13	157	2	159	70	20	10	-	10	-	10
Metallurgy	21	49	18	12	197	2	199	-	-	-	1	1	-	1
Meteorology	16	34	28	22	241	3	244	17	50	17	17	6	-	6
Mathematics	37	37	14	11	421	2	423	36	26	15	23	94	1	95
Engineering														
All other engineering . .	26	41	19	15	616	6	622	-	-	-	100	3	-	3
Civil engineering	30	40	17	13	658	4	662	60	20	20	-	5	-	5
Chemical engineering . .	39	42	12	6	706	10	716	14	14	57	14	7	-	7
Electrical engineering .	26	38	21	14	843	16	859	-	100	-	-	1	-	1
Mechanical engineering .	23	41	23	12	843	5	848	100	-	-	-	3	1	4
Life Sciences														
All other biology	24	43	21	12	369	3	372	27	33	18	22	60	-	60
Anatomy	23	44	21	11	171	1	172	38	26	12	24	66	-	66
General biology	29	45	15	12	400	4	404	26	24	15	36	399	4	403
Biochemistry	43	42	11	3	410	7	417	48	37	11	4	104	-	104
Botany	25	41	22	12	480	7	487	37	33	9	21	105	-	105
Biophysics	35	44	13	8	181	3	184	50	33	17	-	18	1	19
Genetics	19	48	20	13	222	4	226	48	34	12	5	56	1	57
Microbiology	28	42	18	12	421	4	425	42	34	8	16	237	2	239
Pathology	4	38	42	16	106	4	110	25	50	12	12	8	-	8
Pharmacology	28	42	20	10	200	2	202	38	27	8	27	26	-	26
Physiology	21	45	23	10	375	4	379	36	35	8	20	85	-	85
Zoology	27	47	17	10	470	7	477	52	27	10	10	145	3	148
Agriculture	23	41	23	12	461	4	465	50	38	12	-	8	-	8
Forestry	23	39	22	16	459	10	469	50	25	-	25	4	-	4
Behavioral Sciences														
Psychology	28	48	16	8	483	9	492	34	23	15	28	204	2	206
Anthropology	26	39	20	15	377	4	381	32	24	16	28	220	8	228
Economics	23	39	19	19	613	8	621	40	21	10	29	58	-	58
Sociology	28	38	20	14	381	1	382	23	23	16	38	176	1	177
Humanities														
English	33	37	20	10	238	5	243	30	29	13	28	267	5	272
History	30	37	20	13	437	8	445	34	28	18	20	131	2	133
Social Work														
Social work	14	37	20	29	326	6	332	28	23	8	41	460	7	467

TABLE B.4

FIELD OF STUDY BY SEX AND RACE

(Per Cent)

Field of Study	Total Sample		Sex											
			Male						Female					
	Male	Female	Race			N	NA	Total N	Race			N	NA	Total N
			White	Negro	Other				White	Negro	Other			
Physical Sciences														
General physical sciences . .	89	11	96	4	1	142	1	143	88	12	-	17	-	17
All other earth and physical sciences	95	5	98	-	2	261	-	261	100	-	-	13	-	13
Astronomy	89	11	99	-	-	209	4	213	100	-	-	26	-	26
Chemistry	88	12	97	2	1	504	4	508	100	-	-	71	1	72
Physics	97	3	99	1	1	480	2	482	100	-	-	17	-	17
Geography	86	14	99	1	-	459	10	469	92	6	1	79	-	79
Geology and geophysics . . .	97	3	99	-	1	473	3	476	100	-	-	17	-	17
Oceanography	94	6	99	1	1	157	2	159	100	-	-	10	-	10
Metallurgy	99	-	100	-	-	197	2	199	100	-	-	1	-	1
Meteorology	98	2	96	2	2	243	1	244	100	-	-	6	-	6
Mathematics	82	18	98	1	1	421	2	423	92	5	2	94	1	95
Engineering														
All other engineering	100	-	99	-	1	613	9	622	100	-	-	3	-	3
Civil engineering	99	1	99	-	1	656	6	662	100	-	-	5	-	5
Chemical engineering	99	1	98	-	2	710	6	716	100	-	-	7	-	7
Electrical engineering . . .	100	-	99	-	1	845	14	859	100	-	-	1	-	1
Mechanical engineering . . .	100	-	98	-	2	845	3	848	100	-	-	3	1	4
Life Sciences														
All other biology	86	14	98	-	2	371	1	372	82	18	-	60	-	60
Anatomy	72	28	97	2	1	169	3	172	97	3	-	66	-	66
General biology	50	50	94	4	2	402	2	404	95	3	2	399	4	403
Biochemistry	80	20	98	1	1	415	2	417	97	1	2	102	2	104

TABLE B.4--Continued

Field of Study	Total Sample		Sex											
			Male						Female					
	Male	Female	Race			N	NA	Total N	Race			N	NA	Total N
			White	Negro	Other				White	Negro	Other			
Life Sciences--continued														
Botany	82	18	99	1	-	481	6	487	97	-	3	105	-	105
Biophysics	91	9	97	2	1	183	1	184	100	-	-	18	1	19
Genetics	80	20	98	-	2	225	1	226	98	-	2	56	1	57
Microbiology	64	36	96	2	2	423	2	425	97	1	2	238	1	239
Pathology	93	7	100	-	-	108	2	110	100	-	-	8	-	8
Pharmacology	89	11	98	-	2	200	2	202	92	4	4	26	-	26
Physiology	82	18	98	1	1	375	4	379	98	1	1	85	-	85
Zoology	76	24	97	2	1	474	3	477	95	2	3	147	1	148
Agriculture	98	2	98	-	1	464	1	465	100	-	-	8	-	8
Forestry	99	1	99	-	1	464	5	469	100	-	-	3	1	4
Behavioral Sciences														
Psychology	70	30	99	1	1	488	4	492	98	2	-	205	1	206
Anthropology	63	37	98	1	1	379	2	381	96	4	-	223	5	228
Economics	91	9	98	1	1	613	8	621	100	-	-	58	-	58
Sociology	68	32	96	3	2	380	2	382	95	2	3	177	-	177
Humanities														
English	47	53	99	1	-	241	2	243	100	-	-	270	2	272
History	77	23	98	2	-	438	7	445	96	3	1	133	-	133
Social Work														
Social work	41	58	88	11	2	330	2	332	90	10	-	459	8	467

TABLE B.5

FIELD OF STUDY BY NUMBER OF DEPENDENTS AND AGE

(Per Cent)

Field of Study	Number of Dependents																											
	None							One							Two							Three or More						
	Age				N	NA	Total N	Age				N	NA	Total N	Age				N	NA	Total N	Age				N	NA	Total N
	20-24	25-29	30-34	35+				20-24	25-29	30-34	35+				20-24	25-29	30-34	35+				20-24	25-29	30-34	35+			
Physical Sciences																												
General physical sciences	32	43	20	5	37	1	38	17	52	26	4	23	-	23	6	55	24	15	33	-	33	2	17	32	50	60	-	60
All other earth and physical sciences.	44	43	9	4	91	-	91	37	44	15	4	27	1	28	13	43	30	13	46	-	46	5	32	28	34	93	-	93
Astronomy	58	34	4	4	102	2	104	40	46	9	5	43	-	43	15	54	15	15	26	-	26	5	34	21	39	38	-	38
Chemistry	48	43	6	4	235	3	238	38	52	7	2	86	-	86	25	44	22	9	96	1	97	8	34	28	30	94	-	94
Physics	53	39	7	-	208	2	210	27	55	16	2	86	-	86	22	51	24	4	55	1	56	6	38	26	29	102	-	102
Geography	27	38	16	18	215	1	216	16	52	21	12	58	-	58	23	37	23	18	62	-	62	-	22	34	43	129	1	130
Geology and geophysics	45	45	8	2	179	1	180	26	56	13	4	68	2	70	23	55	19	3	62	-	62	2	37	34	28	123	1	124
Oceanography	42	44	12	2	52	-	52	19	54	19	8	26	-	26	8	52	36	4	25	1	26	4	27	37	33	52	1	53
Metallurgy	56	38	3	3	39	1	40	24	57	16	3	37	1	38	9	60	17	14	35	-	35	3	43	29	25	72	-	72
Meteorology	41	48	7	3	58	2	60	15	58	21	6	33	1	34	5	44	33	18	39	-	39	1	17	42	41	101	-	101
Mathematics	52	34	6	8	211	3	214	33	44	7	16	90	-	90	31	47	16	6	62	-	62	6	27	38	28	102	-	102
Engineering																												
All other engineering	54	35	5	6	155	1	156	35	44	15	6	95	1	96	17	59	18	6	125	-	125	2	31	34	33	212	2	214
Civil engineering .	58	32	7	3	178	-	178	35	52	12	1	103	1	104	22	48	12	18	105	-	105	5	37	31	27	221	-	221
Chemical engineering	62	29	7	2	269	4	273	32	58	6	4	136	-	136	24	54	15	7	109	-	109	3	48	31	18	143	3	146
Electrical engineering	52	36	8	4	226	5	231	33	50	9	8	140	1	141	14	48	25	12	153	1	154	3	31	38	28	276	4	280
Mechanical engineering	52	37	7	4	223	1	224	26	52	17	4	111	-	111	18	55	19	8	165	2	167	2	32	40	26	297	2	299
Life Sciences																												
All other biology. .	33	45	12	10	140	-	140	28	43	18	10	60	-	60	24	43	24	10	63	1	64	6	36	35	24	118	1	119
Anatomy	39	33	12	16	82	-	82	30	35	13	22	23	-	23	27	53	10	10	30	1	31	4	39	41	16	51	-	51
General biology . .	39	39	12	10	311	3	314	36	32	15	17	108	1	109	11	34	30	26	104	-	104	-	26	16	58	151	-	151
Biochemistry	59	31	8	1	236	2	238	38	57	3	1	73	3	76	21	61	11	7	71	1	72	3	50	36	11	64	1	65

TABLE B.5--Continued

Field of Study	Number of Dependents																											
	None							One							Two							Three or More						
	Age				N	NA	Total N	Age				N	NA	Total N	Age				N	NA	Total N	Age				N	NA	Total N
	20-24	25-29	30-34	35+				20-24	25-29	30-34	35+				20-24	25-29	30-34	35+				20-24	25-29	30-34	35+			
Life Sciences--Continued																												
Botany	37	45	10	8	220	-	220	31	37	16	16	102	-	102	21	50	25	4	52	-	52	1	27	43	30	134	2	136
Biophysics . . .	51	39	7	3	87	1	88	34	54	6	6	35	-	35	27	50	15	8	26	1	27	8	41	35	16	37	-	37
Genetics	42	42	14	2	105	2	107	29	66	3	3	35	2	37	12	61	24	3	33	-	33	2	35	30	33	81	-	81
Microbiology . .	40	43	10	7	284	-	284	19	45	26	10	80	1	81	21	58	17	5	66	-	66	3	28	22	47	117	3	120
Pathology . . .	25	50	19	6	16	-	16	11	50	22	17	18	1	19	-	52	43	4	23	-	23	-	19	57	23	47	2	49
Pharmacology . .	40	36	15	8	84	-	84	21	64	15	-	33	1	34	24	44	29	3	34	1	35	-	42	24	33	45	-	45
Physiology . . .	33	46	12	9	158	1	159	20	61	15	5	66	1	67	20	51	16	13	61	-	61	3	30	44	23	111	-	111
Zoology	40	44	9	7	270	5	275	26	50	12	11	91	-	91	20	41	28	11	71	-	71	12	33	34	22	95	1	96
Agriculture . .	39	42	14	5	119	-	119	35	48	8	8	62	1	63	21	49	20	11	76	1	77	4	32	42	22	165	1	166
Forestry	42	43	9	6	127	5	132	27	45	19	9	75	1	76	17	56	18	9	66	1	67	3	25	38	34	154	2	156
Behavioral Sciences																												
Psychology . . .	35	35	13	17	308	4	312	32	48	12	8	102	1	103	15	59	23	3	92	2	94	4	40	30	26	96	3	99
Anthropology . .	32	32	16	20	322	7	329	32	38	16	14	81	1	82	13	52	16	19	31	1	32	7	30	26	38	74	-	74
Economics . . .	37	40	14	9	224	2	226	34	43	12	11	93	1	94	15	49	19	17	89	-	89	-	25	30	45	190	2	192
Sociology . . .	35	31	15	19	231	1	232	22	41	17	20	76	-	76	18	42	21	19	62	-	62	2	24	36	38	90	-	90
Humanities																												
English	37	26	16	21	241	3	244	25	47	10	18	60	-	60	15	56	5	23	39	-	39	12	20	39	29	49	2	51
History	37	34	15	13	261	3	264	29	38	16	16	55	1	56	16	47	27	9	55	1	56	5	29	33	32	78	1	79
Social Work																												
Social work . .	27	30	10	33	389	4	393	23	25	8	44	79	1	80	10	43	15	32	72	-	72	-	22	22	56	116	4	120

TABLE B.6

FIELD OF STUDY BY MARITAL STATUS AND NUMBER OF DEPENDENTS

(Per Cent)

Field of Study	Marital Status													
	Single							Presently or Previously Married						
	Number of Dependents				N	NA	Total N	Number of Dependents				N	NA	Total N
	None	One	Two	Three or More				None	One	Two	Three or More			
Physical Sciences														
General physical sciences	97	3	-	-	29	3	32	8	18	26	48	125	2	127
All other earth and physical sciences. .	92	5	3	-	77	12	89	11	13	24	51	181	3	184
Astronomy	96	-	4	-	84	25	109	18	34	18	30	127	1	128
Chemistry	95	4	1	-	204	58	262	14	25	30	30	311	6	317
Physics	97	2	1	-	172	41	213	15	29	20	36	282	4	286
Geography	98	2	1	-	128	63	191	27	17	18	38	338	16	354
Geology and geophysics	100	-	-	-	121	51	172	19	22	20	39	315	4	319
Oceanography	100	-	-	-	37	11	48	12	22	22	44	120	-	120
Metallurgy	94	6	-	-	36	14	50	4	24	23	48	149	-	149
Meteorology	100	-	-	-	47	15	62	7	18	21	54	187	1	188
Mathematics	94	5	-	1	182	42	224	15	28	22	35	286	8	294
Engineering														
All other engineering.	95	4	-	1	139	28	167	5	20	28	47	452	3	455
Civil engineering . .	93	6	1	-	154	48	202	8	21	33	49	454	7	461
Chemical engineering .	95	4	1	-	241	49	290	10	30	25	35	423	4	427
Electrical engineering	91	8	-	-	215	45	260	6	21	26	47	591	1	592
Mechanical engineering	92	7	1	-	199	41	240	6	16	27	50	601	8	609
Life Sciences														
All other biology . .	96	4	-	-	104	44	148	14	20	23	43	279	3	282
Anatomy	93	7	-	-	59	42	101	21	15	24	40	128	9	137
General biology . . .	92	7	1	-	252	86	338	19	21	24	35	426	37	463
Biochemistry	94	5	1	-	196	65	261	21	26	28	25	255	3	258
Botany	95	5	-	-	161	64	225	19	27	15	39	349	15	364
Biophysics	97	-	1	1	69	15	84	18	30	22	30	118	-	118
Genetics	97	1	-	1	76	21	97	18	20	18	44	182	3	185
Microbiology	97	3	-	-	155	100	255	34	19	17	30	396	12	408
Pathology	100	-	-	-	14	8	22	2	20	25	53	93	2	95
Pharmacology	95	3	2	-	59	25	84	20	23	25	32	139	5	144
Physiology	98	2	-	-	111	54	165	17	23	21	39	287	8	295
Zoology	96	4	-	-	172	79	251	30	23	20	27	361	9	370
Agriculture	91	8	-	1	89	41	130	11	17	23	49	336	7	343
Forestry	96	4	-	-	93	35	128	13	21	20	46	338	7	345
Behavioral Sciences														
Psychology	97	2	1	1	183	73	256	32	24	22	23	425	12	437
Anthropology	97	3	-	-	180	69	249	46	23	9	22	337	22	359
Economics	96	4	-	-	156	66	222	17	20	20	43	445	9	454
Sociology	95	5	-	1	150	75	225	29	22	20	29	310	19	329
Humanities														
English	92	7	-	1	156	100	256	42	21	16	21	238	20	258
History	92	8	1	-	184	91	275	35	16	20	29	270	21	291
Social Work														
Social work	98	2	-	-	220	107	327	40	17	16	27	445	21	466

TABLE B.7

FIELD OF STUDY BY TYPE OF CURRENT RESIDENCE

(Per Cent)

Field of Study	Type of Current Residence								N	NA	Total N
	With My Parents	University			Room or Apartment Rented from Private Landlord	Single-Family House		Other			
		Dormitory	University -Owned Apartment	Prefab or Trailer		Rented	Owned				
Physical Sciences											
General physical sciences	7	4	5	2	29	14	33	6	159	1	160
All other earth and physical sciences.	10	4	9	1	42	11	19	4	272	2	274
Astronomy	7	8	8	1	50	7	15	4	237	2	239
Chemistry	9	6	12	2	47	6	12	7	579	1	580
Physics	9	6	10	1	46	9	14	4	499	-	499
Geography	13	2	9	2	41	9	17	7	545	3	548
Geology and geophysics	5	4	13	3	46	10	15	4	491	2	493
Oceanography	4	4	11	1	38	28	11	3	169	-	169
Metallurgy	12	3	6	2	36	8	29	5	199	1	200
Meteorology	5	5	9	-	36	22	18	5	249	1	250
Mathematics	12	4	10	1	43	7	16	7	518	-	518
Engineering											
All other engineering	9	4	8	-	36	14	26	2	623	2	625
Civil engineering. .	9	3	7	2	40	13	22	5	663	4	667
Chemical engineering	11	5	9	-	47	10	15	2	717	6	723
Electrical engineering	10	5	4	1	35	9	34	3	852	8	860
Mechanical engineering	9	2	5	1	40	13	28	3	849	3	852

TABLE B.7--Continued

Field of Study	Type of Current Residence								N	NA	Total N
	With My Parents	University			Room or Apartment Rented from Private Landlord	Single-Family House		Other			
		Dormitory	University -Owned Apartment	Prefab or Trailer		Rented	Owned				
Life Sciences											
All other biology .	5	3	17	2	44	13	9	7	430	2	432
Anatomy	7	6	8	1	51	5	14	8	236	2	238
General biology . .	14	9	7	-	39	9	14	7	801	6	807
Biochemistry	8	5	9	1	59	6	8	4	519	2	521
Botany	7	6	16	5	40	8	11	7	589	3	592
Biophysics	4	7	9	-	55	8	9	6	202	1	203
Genetics	3	7	13	1	42	17	11	6	282	1	283
Microbiology . . .	5	5	9	1	49	11	14	6	662	2	664
Pathology	5	3	9	-	34	15	31	3	117	1	118
Pharmacology . . .	10	7	11	1	49	5	12	5	227	1	228
Physiology	3	5	10	1	48	13	16	4	460	4	464
Zoology	6	6	15	3	45	9	10	6	620	5	625
Agriculture	3	3	19	5	36	12	13	8	473	-	473
Forestry	4	4	17	4	36	16	14	5	472	1	473
Behavioral Sciences											
Psychology	8	3	9	2	52	9	12	4	694	4	698
Anthropology . . .	5	3	7	-	60	11	8	6	608	1	609
Economics	6	4	12	3	42	9	20	5	675	4	679
Sociology	9	4	9	1	44	12	15	6	554	5	559
Humanities											
English	12	4	4	1	49	6	14	9	513	2	515
History	14	7	8	1	43	8	11	8	570	8	578
Social Work											
Social work	8	4	4	1	49	7	20	8	791	8	799

TABLE C.1a

FIELD OF STUDY AND STIPEND HOLDING

(Per Cent Holding None, One, Two, or Three Stipends[a])

Field of Study	Number of Stipends				N
	None	One	Two	Three	
Physical Sciences					
General physical sciences	37 (160)	62 (158)	14 (154)	4 (158)	160
Other earth and physical sciences .	32 (274)	66 (269)	17 (273)	2 (274)	274
Astronomy	17 (239)	83 (238)	27 (237)	4 (238)	239
Chemistry	19 (576)	81 (572)	30 (571)	8 (573)	578
Physics	24 (449)	75 (494)	20 (496)	2 (497)	499
Geography	42 (548)	56 (538)	14 (542)	3 (546)	548
Geology and geophysics	27 (493)	71 (483)	23 (489)	4 (489)	493
Oceanography.	11 (169)	88 (167)	27 (169)	5 (169)	169
Metallurgy.	38 (200)	62 (198)	11 (198)	2 (199)	200
Meteorology	21 (250)	77 (244)	14 (248)	3 (246)	250
Mathematics	32 (516)	67 (508)	20 (510)	3 (510)	517
Engineering					
All other engineering	31 (623)	67 (605)	17 (615)	3 (620)	624
Civil engineering . .	37 (665)	62 (657)	16 (659)	3 (661)	665
Chemical engineering.	29 (723)	69 (713)	24 (728)	2 (721)	723
Electrical engineering	44 (858)	55 (844)	12 (845)	3 (849)	858
Mechanical engineering	41 (850)	58 (839)	15 (846)	3 (845)	851

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[a] N's differ within rows because of variation in NA's.

TABLE C.1a--Continued

Field of Study	Number of Stipends				N
	None	One	Two	Three	
Life Sciences					
All other biology. . .	19 (430)	79 (421)	21 (424)	4 (427)	431
Anatomy.	16 (238)	81 (233)	21 (235)	3 (237)	238
General biology. . . .	28 (807)	69 (784)	18 (801)	4 (805)	807
Biochemistry	8 (521)	90 (514)	22 (517)	2 (520)	521
Botany	11 (592)	87 (586)	25 (581)	6 (591)	592
Biophysics	9 (203)	91 (202)	28 (203)	7 (202)	203
Genetics	11 (283)	87 (275)	22 (281)	3 (283)	283
Microbiology	13 (662)	85 (651)	16 (658)	3 (659)	663
Pathology.	27 (118)	71 (116)	14 (116)	3 (117)	118
Pharmacology	14 (228)	84 (223)	17 (227)	2 (227)	228
Physiology	14 (464)	84 (456)	24 (462)	4 (464)	464
Zoology.	16 (625)	83 (617)	26 (611)	4 (621)	625
Agriculture.	23 (473)	74 (462)	12 (471)	2 (473)	473
Forestry	29 (473)	71 (471)	15 (467)	3 (472)	473
Behavioral Sciences					
Psychology	34 (698)	65 (686)	20 (685)	4 (693)	698
Anthropology	33 (609)	66 (604)	20 (603)	4 (608)	609
Economics.	38 (679)	61 (673)	17 (676)	3 (678)	679
Sociology	37 (559)	62 (553)	18 (553)	3 (556)	559
Humanities					
English.	54 (513)	43 (500)	10 (506)	2 (511)	514
History.	53 (576)	46 (570)	9 (571)	1 (572)	577
Social Work					
Social work	23 (797)	74 (776)	13 (789)	2 (795)	798

TABLE C.1b

FIELD OF STUDY AND TYPE OF FIRST STIPEND
(Per Cent)

Field of Study	Type of First Stipend				N	No Sti-pends	NA	Total N
	Scholarship ≤ Tuition	Fellowship Tuition + Cash	Research Assistant	Teaching Assistant				
Physical Sciences								
General physical sciences.	13	70	6	11	99	59	2	160
All other earth and physical sciences .	29	31	34	6	182	87	5	274
Astronomy	13	33	38	17	198	40	1	239
Chemistry	10	20	29	42	468	108	4	580
Physics	11	24	38	27	373	121	5	499
Geography	17	20	13	49	306	232	10	548
Geology and geophysics	7	24	25	45	348	135	10	493
Oceanography.	5	29	59	7	148	19	2	169
Metallurgy.	32	16	45	7	123	75	2	200
Meteorology	22	27	47	5	192	52	6	250
Mathematics	19	34	9	38	345	165	8	518
Engineering								
All other engineering	34	29	23	14	416	191	18	625
Civil engineering . .	22	29	25	25	413	246	8	667
Chemical engineering.	18	39	27	16	501	212	10	723
Electrical engineering	44	21	20	15	470	378	12	860
Mechanical engineering	40	21	19	19	491	350	11	852
Life Sciences								
All other biology . .	3	21	58	19	342	81	9	432
Anatomy	5	53	12	31	194	39	5	238
General biology . . .	12	51	10	27	560	224	23	807
Biochemistry.	10	42	36	11	471	43	7	521
Botany.	5	19	31	45	518	68	6	592
Biophysics.	5	76	16	4	184	18	1	203
Genetics.	4	40	41	14	245	30	8	283
Microbiology.	12	30	36	22	566	87	11	664
Pathology	18	49	24	10	84	32	2	118
Pharmacology.	3	61	22	15	192	31	5	228
Physiology.	7	50	22	21	391	65	8	464
Zoology	4	24	24	48	520	97	8	625
Agriculture	4	12	76	9	351	111	11	473
Forestry.	9	20	57	14	335	136	2	473

TABLE C.1b--Continued

Field of Study	Type of First Stipend				N	No Sti-pends	NA	Total N
	Scholarship ≤ Tuition	Fellowship Tuition + Cash	Research Assistant	Teaching Assistant				
Behavioral Sciences								
Psychology.	10	34	35	22	452	234	12	698
Anthropology.	11	47	18	24	400	204	5	609
Economics	14	33	32	21	414	259	6	679
Sociology	10	30	33	27	345	208	6	559
Humanities								
English	23	22	6	49	223	279	13	515
History	24	31	11	33	268	304	6	578
Social Work								
Social work	17	75	5	2	594	184	21	799

TABLE C.1c

FIELD OF STUDY AND SOURCE OF FIRST STIPEND
(Per Cent Receiving First Stipend)

Field of Study	Atomic Energy Commission	Department of Defense	National Science Foundation	Veterans Administration	National Aeronautics and Space Administration	Office of Educ.		Public Health Service		Other Public Health Service	Other Federal Government	Sub-total Federal Government	Private Foundations, Philanthropic Orgn.	Industry, Business Firm	Directly from School	School, Source Unknown	State or Local Government	Foreign Government	Other	Sub-total Non-Government	N	Not Applicable	No Answer	Total
						Nat'l Defense Education Act	Other	Nat'l Inst. of Health Fellowship Program	NIH Training															
Physical Sciences																								
Gen. phys. sci. . .	4	0	81	0	0	0	0	0	0	0	0	85	1	0	9	2	2	0	1	15	99	59	2	160
All other earth & phys. sci. . .	5	16	13	0	1	2	0	2	0	1	4	43	3	29	16	5	3	0	1	57	182	87	5	274
Astronomy	2	10	16	0	7	6	0	0	0	0	4	44	3	3	38	12	*	0	*	56	198	40	1	239
Chemistry	8	3	10	0	*	2	0	4	2	2	2	34	3	10	42	8	2	0	1	66	468	108	4	580
Physics	14	8	17	0	2	2	0	0	1	1	3	49	3	8	31	7	2	0	1	51	373	121	5	499
Geography	0	2	3	0	1	7	0	0	0	*	1	12	9	0	69	5	3	0	2	88	306	232	10	548
Geology and geophysics. . . .	1	3	12	*	*	5	0	0	*	0	2	24	4	6	54	8	3	0	*	76	348	135	10	493
Oceanography. . . .	6	12	11	0	0	7	0	1	2	3	18	59	5	3	18	10	4	0	1	41	148	19	2	169
Metallurgy.	15	8	5	0	7	2	0	0	0	0	2	40	5	28	25	1	2	0	0	60	123	75	2	200
Meteorology	1	35	10	0	3	3	0	0	0	0	19	71	6	2	13	5	1	0	2	29	192	52	6	250
Mathematics	1	3	22	*	*	5	0	0	1	0	2	35	3	13	37	7	4	*	*	65	345	165	8	518
Engineering																								
All other engineering . . .	6	10	6	*	2	2	0	1	1	1	4	35	5	29	23	7	1	0	1	65	416	191	18	625
Civil engineering .	*	6	7	*	0	3	0	1	3	5	3	28	5	12	38	7	9	*	1	72	413	246	8	667
Chemical engineering . . .	4	1	12	0	3	7	1	1	*	1	3	33	5	28	26	7	2	0	*	67	501	212	10	723
Electrical engineering . . .	*	7	6	*	4	1	0	0	*	0	3	22	2	41	26	6	1	0	2	78	470	378	12	860
Mechanical engineering . . .	3	8	6	*	6	2	0	0	0	0	2	27	5	33	30	3	1	0	*	73	491	350	11	852

TABLE C.1c--Continued

(Per Cent Receiving First Stipend)

Field of Study	Atomic Energy Commission	Department of Defense	National Science Foundation	Veterans Administration	Nat'l Aeronautics and Space Adm.	Office of Educ.		Public Health Serv.		Other Public Health Service	Other Federal Government	Sub-total Federal Government	Private Foundations Philanthropic Orgn.	Industry, Business Firm	Directly from School	School, Source Unknown	State or Local Government	Foreign Government	Other	Sub-total Non-Government	N	Not Applicable	No Answer	Total
						Nat'l Defense Education Act	Other	Nat'l Inst. of Health Fellowship Program	NIH Training															
Life Sciences																								
All other biology	1	*	12	*	0	5	0	4	6	3	3	35	4	4	34	16	6	0	2	65	342	81	9	432
Anatomy.	0	1	3	1	0	1	1	9	0	2	3	65	3	0	21	8	3	0	1	35	194	39	5	238
General biology.	1	0	38	0	0	1	*	5	8	2	1	56	4	2	27	6	5	0	1	44	560	224	23	807
Biochemistry . .	1	*	7	*	0	2	*	18	25	8	1	63	3	2	13	11	7	*	1	37	471	43	7	521
Botany	1	0	18	0	*	4	0	2	1	2	2	30	2	2	46	14	5	0	*	69	518	68	6	592
Biophysics . . .	9	2	12	0	1	0	0	20	30	7	1	80	2	0	12	5	1	0	0	20	184	18	1	203
Genetics	2	0	15	0	0	4	*	4	17	2	3	47	3	3	31	11	4	*	1	53	245	30	8	283
Microbioloby . .	*	2	18	*	0	1	*	8	21	3	2	55	3	1	23	8	9	0	*	45	566	87	11	644
Pathology. . . .	1	2	0	1	0	0	0	20	30	5	8	68	6	0	14	6	2	0	4	32	84	32	2	118
Pharmacology . .	0	1	2	0	0	1	0	16	49	3	0	71	5	2	16	5	2	0	0	29	192	31	5	228
Physiology . . .	2	2	3	1	1	2	0	17	29	3	2	61	3	1	24	9	2	0	1	39	391	65	8	464
Zoology.	1	*	11	*	0	5	0	5	8	3	1	34	2	*	51	10	2	0	1	66	520	97	8	625
Agriculture. . .	2	1	2	0	0	5	0	1	3	2	5	20	3	6	44	21	5	*	1	80	351	111	11	473
Forestry	2	0	7	0	0	2	0	1	1	*	11	25	7	8	33	13	12	*	1	75	335	136	2	473
Behavioral Sciences																								
Psychology . . .	*	1	6	3	*	2	2	13	11	6	4	47	3	1	33	8	6	0	2	53	452	234	12	698
Anthropology . .	*	*	9	*	0	15	1	8	2	1	1	37	7	1	43	6	3	0	3	63	400	204	5	609
Economics. . . .	0	2	3	*	*	10	0	0	0	*	6	21	11	3	49	8	7	*	2	79	414	259	6	679
Sociology. . . .	*	2	1	0	0	10	1	5	5	3	2	28	6	2	48	9	6	0	1	72	345	208	6	559
Humanities																								
English.	0	*	0	0	0	9	0	0	0	0	0	9	5	1	69	4	10	0	2	91	223	279	13	515
History.	0	1	0	0	0	7	0	*	0	0	1	10	13	2	54	9	8	*	4	90	268	304	6	578
Social Work																								
Social work. . .	0	*	*	3	0	*	2	7	13	2	7	35	16	1	5	3	36	1	4	65	594	184	21	799

*Less than one-half of 1 per cent.

TABLE C.2

TOTAL INCOME BY PER CENT OF TOTAL INCOME FROM STIPENDS

Total Income	1. General Physical Sciences									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.	*									1
Less than $100 to $999	*							*		2
$1,000 - $1,499 .	*						*			3
$1,500 - $2,499 .	*						*	*		5
$2,500 - $2,999 .	*					*		*	*	5
$3,000 - $4,999 .	21	10		3	3	3	3		55	29
$5,000 - $7,999 .	32	16	16	9	7		5	5	11	76
$8,000 - $9,999 .	41	23	5	14	5	5			9	22
$10,000-$10,999 .		*								1
$11,000 and up. .	*	*								13
	2. All Other Earth and Physical Sciences									
$0.										
Less than $100 to $999	*								*	4
$1,000 - $1,499 .	*									2
$1,500 - $2,499 .	*			*	*	*			*	8
$2,500 - $2,999 .	*					*			*	10
$3,000 - $4,999 .	6				3	15	8	13	55	71
$5,000 - $7,999 .	26	8	11	6	14	21	5	3	8	66
$8,000 - $9,999 .	41	18	21	6	12	3				34
$10,000-$10,999 .	52	35	10						3	31
$11,000 and up. .	57	31	5	2	2				2	42

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	3. Astronomy									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.										
Less than $100 to $999	*									3
$1,000 - $1,499 . . .	*									1
$1,500 - $2,499 . . .	*				*	*	*	*	*	14
$2,500 - $2,999 . . .	*		*		*	*	*	*	*	16
$3,000 - $4,999 . . .	6	2	1		7	34	16	7	27	98
$5,000 - $7,999 . . .	8	4	8		38	34	6		2	50
$8,000 - $9,999 . . .	26	4	13	17	26	13				23
$10,000-$10,999 . . .	*	*	*		*					7
$11,000 and up. . . .	52	33	7		4	4				27
	4. Chemistry									
$0.	*									2
Less than $100 to $999	*									3
$1,000 - $1,499 . . .	*									5
$1,500 - $2,499 . . .	8			2	8	5	10	8	60	63
$2,500 - $2,999 . . .						7	4	19	70	54
$3,000 - $4,999 . . .	4	*	1	1	6	17	18	13	38	201
$5,000 - $7,999 . . .	28	15	3	2	26	19	3	3	1	149
$8,000 - $9,999 . . .	44	16	5	9	25	2				57
$10,000-$10,999 . . .	*	*			*				*	13
$11,000 and up. . . .	48	24	12	8		4			4	25

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	5. Physics									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.										
Less than $100 to $999	*									2
$1,000 - $1,499 . .	*									5
$1,500 - $2,499 . .	28	3	3		5	5		13	44	39
$2,500 - $2,999 . .	5		3		8	15	10	18	41	39
$3,000 - $4,999 . .	5	1		2	6	21	16	10	39	156
$5,000 - $7,999 . .	17	6	3		30	27	7	6	4	115
$8,000 - $9,999 . .	47	20	4	3	19	3		3	1	70
$10,000-$10,999 . .	52	24		5	10		5		5	21
$11,000 and up. . .	60	29	2	2	4	2				45
	6. Geography									
$0.										
Less than $100 to $999	*				*				*	15
$1,000 - $1,499 . .	32		5		5	9	41		9	22
$1,500 - $2,499 . .	34		1	4	8	6	8	8	30	71
$2,500 - $2,999 . .	21	3	3	3		9	12	21	29	34
$3,000 - $4,999 . .	29	5	1	4	9	22	11	7	12	112
$5,000 - $7,999 ...	43	8	4	11	19	6	2	2	4	170
$8,000 - $9,999 . .	53	9	5	9	19		2	3		64
$10,000-$10,999 . .	*	*								7
$11,000 and up. . .	73	23	4							48

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	7. Geology and Geophysics									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.	*									1
Less than $100 to $999	*								*	7
$1,000 - $1,499 . .	*					*			*	17
$1,500 - $2,499 . .	31		12	2	2	8	8	8	27	48
$2,500 - $2,999 . .	8			5	15	8	5	15	45	40
$3,000 - $4,999 . .	19	1	2	5	14	24	16	7	13	174
$5,000 - $7,999 . .	24	4	2	9	35	19	1	2	5	127
$8,000 - $9,999 . .	42	2	12	10	25	4	2	2		48
$10,000-$10,999 . .	*				*					8
$11,000 and up. . .	62	14	19		5					21
	8. Oceanography									
$0.										
Less than $100 to $999	1									1
$1,000 - $1,499 . .										
$1,500 - $2,499 . .	1		*					*	*	13
$2,500 - $2,999 . .						*		*	*	7
$3,000 - $4,999 . .	6	3	2		6	21	12	9	41	66
$5,000 - $7,999 . .	8	4	4	6	32	28	4	6	8	50
$8,000 - $9,999 . .	20	15			45	15		5		20
$10,000-$10,999 . .	*				*					3
$11,000 and up... .	*	*	*						*	7

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*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	9. Metallurgy									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.										
Less than $100 to $999	*								*	5
$1,000 - $1,499 . .	*								*	2
$1,500 - $2,499 . .	*								*	2
$2,500 - $2,999 . .	*					*			*	5
$3,000 - $4,999 . .	13		3			16	11		47	38
$5,000 - $7,999 . .	39	13	2		11	13	7		9	54
$8,000 - $9,999 . .	41	34	2		16	4	2		2	56
$10,000-$10,999 . .	*			*		*				14
$11,000 and up. . .	59	36					5			22
	10. Meteorology									
$0.										
Less than $100 to $999					*					1
$1,000 - $1,499 . .	*		*							2
$1,500 - $2,499 . .	*								*	6
$2,500 - $2,999 . .	*		*			*	*	*	*	13
$3,000 - $4,999 . .	10	4	4	6	4	18	10	6	39	51
$5,000 - $7,999 ...	15	4	8	11	11	19	10	8	14	84
$8,000 - $9,999 . .	27	18	29	7	9	2	2		7	45
$10,000-$10,999 . .	*	*	*	*	*			*		17
$11,000 and up. . .	48	26	17	4		4				23

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	Per Cent of Total Income from Stipends									Total N
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
	11. Mathematics									
$0.	*									2
Less than $100 to $999	*		*						*	11
$1,000 - $1,499 . .	*		*	*	*	*			*	13
$1,500 - $2,499 . .	31		2	2	4	7	7	2	44	45
$2,500 - $2,999 . .	11	3	3	3	3	5	16	11	46	37
$3,000 - $4,999 . .	16	2	1	1	5	20	11	9	34	143
$5,000 - $7,999 . .	35	15	7	2	17	12	3	3	6	144
$8,000 - $9,999 . .	53	30	5	2	5	2			2	40
$10,000-$10,999 . .	*	*		*	*	*				18
$11,000 and up. . .	53	33	2	3	2	2			5	58
	12. All Other Engineering									
$0.	*									1
Less than $100 to $999	*								*	4
$1,000 - $1,499 . .									*	2
$1,500 - $2,499 . .	29		4	4	4	21	11	7	21	28
$2,500 - $2,999 . .	*	*			*	*	*	*	*	18
$3,000 - $4,999 . .	4	2	1	4	7	27	22	9	24	113
$5,000 - $7,999 . .	22	14	8	3	18	16	5	7	8	158
$8,000 - $9,999 . .	38	29	11	3	9	6	1	1	2	125
$10,000-$10,999 . .	44	35	6	6			4	2	2	48
$11,000 and up. . .	56	32	5	2	1				3	121

*Less than one-half of 1 per cent.

TABLE C-2--Continued

Total Income	13. Civil Engineering									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.	*									1
Less than $100 to $999	*									1
$1,000 - $1,499 . .	*							*	*	6
$1,500 - $2,499 . .	30		4		22	7			37	27
$2,500 - $2,999 . .	12				34	3	28	3	19	32
$3,000 - $4,999 . .	17		1	2	6	28	15	7	22	144
$5,000 - $7,999 . .	35	7	4	4	17	15	5	4	9	195
$8,000 - $9,999 . .	50	22	6	5	10	2	2	1	3	125
$10,000-$10,999 . .	59	20	2	7	5	2	2	2		41
$11,000 and up. . .	56	17	1	2	12	4	2	4	1	82
	14. Chemical Engineering									
$0.	*									1
Less than $100 to $999	*			*					*	8
$1,000 - $1,499 . .	*					*		*		8
$1,500 - $2,499 . .	29				5	5	10	10	43	21
$2,500 - $2,999 . .	3	3	3	3	23	3	13	3	43	30
$3,000 - $4,999 . .	2	2	*		6	32	16	6	35	220
$5,000 - $7,999 . .	28	10	5	2	25	19	6	1	4	208
$8,000 - $9,999 . .	54	17		3	17	3	2		4	112
$10,000-$10,999 . .	58	26		5	5	3			3	38
$11,000 and up. . .	66	30		1	1	1				67

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	15. Electrical Engineering									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.										
Less than $100 to $999	*					*				5
$1,000 - $1,499 . .	*									2
$1,500 - $2,499 . .	33	4	4		7	15	4	7	26	27
$2,500 - $2,999 . .	30			3		6		17	43	30
$3,000 - $4,999 . .	20	2	1	4	8	31	10	6	18	130
$5,000 - $7,999 . .	40	10	3	3	11	19	3	2	7	174
$8,000 - $9,999 . .	48	35	2	1	6	2	1	1	3	216
$10,000-$10,999 . .	56	36		4	3	1				75
$11,000 and up. . .	60	33	3	2	2	1		1	1	186
	16. Mechanical Engineering									
$0.	*									1
Less than $100 to $999	*								*	5
$1,000 - $1,499 . .	*								*	9
$1,500 - $2,499 . .	43	3		3	3	13	13	7	13	30
$2,500 - $2,999 . .			10		10	20	15	10	35	20
$3,000 - $4,999 . .	12	1	3	1	12	35	7	4	24	147
$5,000 - $7,999 . .	39	15	4	4	10	15	3	3	7	193
$8,000 - $9,999 . .	49	33	6	1	6	2	*	*	1	202
$10,000-$10,999 . .	44	33	7	6	1		1		7	70
$11,000 and up. . .	58	36	2	1	2	1			1	154

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	17. All Other Biology									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0										
Less than $100 to $999	*			*			*			3
$1,000 - $1,499 . .	*					*	*		*	7
$1,500 - $2,499 . .	23			3	3		3	17	50	30
$2,500 - $2,999 . .	5		2			5	11	11	67	57
$3,000 - $4,999 . .	11		1	1	9	16	14	10	39	161
$5,000 - $7,999 . .	24	2	2	4	33	18	2	6	9	136
$8,000 - $9,999 . .	36	4		4	36	12	4	4		25
$10,000-$10,999 . .	*				*					2
$11,000 and up . .	*	*		*	*					8
	18. Anatomy									
$0										
Less than $100 to $999	*								*	3
$1,000 - $1,499 . .	*	*				*		*	*	9
$1,500 - $2,499 . .	32		4		7	11	7	4	36	28
$2,500 - $2,999 . .	*					*	*	*	*	14
$3,000 - $4,999 . .	7		1	2	2	10	10	11	56	82
$5,000 - $7,999 . .	8	10	2	5	17	21	10	8	21	63
$8,000 - $9,999 . .	20		5	5	45	10			15	20
$10,000-$10,999 . .	*				*	*				7
$11,000 and up . .	*	*	*			*				11

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	19. General Biology									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									1
Less than $100 to $999	*							*	*	13
$1,000 - $1,499 . .	*	*	*	*		*		*		16
$1,500 - $2,499 . .	40	2		1	3	5		24	25	88
$2,500 - $2,999 . .	7				12	2	10	19	50	42
$3,000 - $4,999 . .	19	3	1	4	1	7	14	17	35	284
$5,000 - $7,999 . .	29	9	7	3	11	2	3	3	13	227
$8,000 - $9,999 . .	46	6	6	4	25	8			4	48
$10,000-$10,999 . .	*	*	*		*					17
$11,000 and up . .	30	30	11	3	24	2				63
	20. Biochemistry									
$0	*									1
Less than $100 to $999					*				*	4
$1,000 - $1,499 . .	*			*		*				7
$1,500 - $2,499 . .	7		7		12	5			68	41
$2,500 - $2,999 . .	2	3	9		2		3	8	74	66
$3,000 - $4,999 . .	5	4	1	*	5	15	13	13	43	218
$5,000 - $7,999 . .	13	5	3	2	35	24	8	2	8	136
$8,000 - $9,999 . .	11	6	3	3	54	11			11	35
$10,000-$10,999 . .				*		*				2
$11,000 and up . .	*	*	*	*		*	*			10

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	21. Botany									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0.	*									1
Less than $100 to $999	*			*					*	10
$1,000 - $1,499 . .	*						*	*	*	18
$1,500 - $2,499 . .	26	2	2	10	3	8	2	2	47	62
$2,500 - $2,999 . .	2		1		2	3	6	19	66	98
$3,000 - $4,999 . .	5		6		11	21	12	8	38	202
$5,000 - $7,999 . .	12	10	5	7	41	18	1	1	5	142
$8,000 - $9,999 . .	12	12	4	12	44	12		4		25
$10,000-$10,999 . .	*	*		*						6
$11,000 and up . .	32	12	16	4	4	24	8			25
	22. Biophysics									
$0										
Less than $100 to $999	*									1
$1,000 - $1,499 . .										
$1,500 - $2,499 . .	*		*		*	*		*	*	13
$2,500 - $2,999 . .	*						*	*	*	11
$3,000 - $4,999 . .	1					7	17	16	59	76
$5,000 - $7,999 . .	10	5	-	2	10	41	10	5	19	63
$8,000 - $9,999 . .	10		10	10	40	25		5		20
$10,000-$10,999 . .	*		*		*	*				6
$11,000 and up . .	*	*		*	*	*		*		13

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	23. Genetics									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0										
Less than $100 to $999										
$1,000 - $1,499 . .	*					*				2
$1,500 - $2,499 . .	*				*	*	*	*	*	18
$2,500 - $2,999 . .					3		3	10	83	30
$3,000 - $4,999 . .	4		3	2	4	18	9	14	48	111
$5,000 - $7,999 . .	10	5	3	5	28	26	10	3	9	86
$8,000 - $9,999 . .	*				*		*			17
$10,000-$10,999 . .		*	*	*	*			*		7
$11,000 and up . .	*	*	*	*						11
	24. Microbiology									
$0	*									1
Less than $100 to $999	*					*				6
$1,000 - $1,499 . .									*	3
$1,500 - $2,499 . .	9	1	5	5	8	17	3	5	47	78
$2,500 - $2,999 . .			4	6		27	7	7	48	98
$3,000 - $4,999 . .	11	2	8	3	11	17	11	11	27	186
$5,000 - $7,999 . .	16	6	4	6	36	13	2	1	16	210
$8,000 - $9,999 . .	16	2	41	8	20	4	2		6	49
$10,000-$10,999 . .	*	*		*	*	*				12
$11,000 and up . .	*	*	*			*				13

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*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	25. Pathology									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									1
Less than $100 to $999										
$1,000 - $1,499 . .										
$1,500 - $2,499 . .	*				*					2
$2,500 - $2,999 . .						*		*		2
$3,000 - $4,999 . .	*	*					*	*	*	10
$5,000 - $7,999 . .	17	6	4	4	10	8	2	10	40	52
$8,000 - $9,999 . .	31	19	8		12	4	4	8	15	26
$10,000-$10,999 . .	*				*				*	4
$11,000 and up . .	50	15			10	20	5			20
	26. Pharmacology									
$0	*									1
Less than $100 to $999	*								*	2
$1,000 - $1,499 . .				*					*	2
$1,500 - $2,499 . .	*			*					*	13
$2,500 - $2,999 . .					*	*	*	*	*	17
$3,000 - $4,999 . .	4	1	1		5	12	11	14	51	74
$5,000 - $7,999 . .	14		1	5	22	28	3	4	22	76
$8,000 - $9,999 . .	15	5	5	10	50	5			10	20
$10,000-$10,999 . .	*				*					5
$11,000 and up . .	*	*	*	*	*	*				16

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	27. Physiology									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									1
Less than $100 to $999						*				1
$1,000 - $1,499 . .	*				*		*		*	5
$1,500 - $2,499 . .	25		2		10	5	10	5	43	40
$2,500 - $2,999 . .	3		3		5	8	8	8	65	37
$3,000 - $4,999 . .	6		1	1	7	16	11	10	49	158
$5,000 - $7,999 . .	12	4	7	4	27	17	3	5	20	128
$8,000 - $9,999 . .	23	5	5	7	30	8	7	3	13	61
$10,000-$10,999 . .	*				*	*			*	10
$11,000 and up . .	45	14	9	14	9	5	5			22
	28. Zoology									
$0	*									4
Less than $100 to $999	*							*	*	9
$1,000 - $1,499 . .	*				*			*		14
$1,500 - $2,499 . .	9		1	2	2	10	9	11	56	90
$2,500 - $2,999 . .	2				4	6	15	22	51	81
$3,000 - $4,999 . .	9		2	2	8	22	15	13	30	163
$5,000 - $7,999 . .	20	2	6	7	40	13	4	3	5	189
$8,000 - $9,999 . .	17	10	5	7	44	12	2	2		41
$10,000-$10,999 . .	*	*	*		*		*			8
$11,000 and up . .	35	9	17	22	17					23

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*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	29. Agriculture									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									2
Less than $100 to $999									*	2
$1,000 - $1,499 . .	*					*	*		*	8
$1,500 - $2,499 . .	29				2	4	6	10	48	48
$2,500 - $2,999 . .	5				2	7	7	25	54	44
$3,000 - $4,999 . .	6	3		1	5	23	14	16	33	168
$5,000 - $7,999 . .	34	3	2	1	35	10	6	4	6	145
$8,000 - $9,999 . .	57	3		8	24			3	5	37
$10,000-$10,999 . .	*	*		*						5
$11,000 and up . .	*	*			*				*	11
	30. Forestry									
$0	*									2
Less than $100 to $999					*				*	4
$1,000 - $1,499 . .	*				*		*		*	8
$1,500 - $2,499 . .	37	2	2		5	11	13	5	27	63
$2,500 - $2,999 . .	14	2	2	6	8	12	10	12	33	49
$3,000 - $4,999 . .	13	2	2	3	15	29	10	10	15	136
$5,000 - $7,999 . .	33	3	7	9	34	8	2		3	148
$8,000 - $9,999 . .	61	10	5	15	5	2	2			41
$10,000-$10,999 . .	*	*	*		*				*	8
$11,000 and up . .	*	*	*							11

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	31. Psychology									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									1
Less than $100 to $999	*			*	*	*	*		*	16
$1,000 - $1,499 . .	*		*	*	*			*	*	16
$1,500 - $2,499 . .	35	1	1	2	6	7	12	9	26	88
$2,500 - $2,999 . .	20		2	2	7	5	9	22	33	55
$3,000 - $4,999 . .	20	2	3	2	7	24	12	13	19	194
$5,000 - $7,999 . .	38	5	1	5	25	15	2	3	7	198
$8,000 - $9,999 . .	40	5	2	9	35	5	2	2		55
$10,000-$10,999 . .	57	10	10	14	10					21
$11,000 and up . .	52	20	10	10	4	2	2			50
	32. Anthropology									
$0	*									1
Less than $100 to $999	*			*		*			*	14
$1,000 - $1,499 . .	*				*	*			4	13
$1,500 - $2,499 . .	40	1	1	1	13	3	1	6	31	67
$2,500 - $2,999 . .	16	2		4	9	14	27	11	18	56
$3,000 - $4,999 . .	23	5	1	5	8	14	7	10	28	199
$5,000 - $7,999 . .	33	5	5	7	23	15	1	5	5	149
$8,000 - $9,999 . .	37		10	10	33	7	2			46
$10,000-$10,999 . .	*		*	*	*					8
$11,000 and up . .	51	12	10	12	6	2			6	49

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	33. Economics									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									4
Less than $100 to $999	*	*								3
$1,000 - $1,499 . .	*		*							13
$1,500 - $2,499 . .	33	1	4		9	9	12	4	27	67
$2,500 - $2,999 . .	11	2	2	2	9	19	15	13	26	53
$3,000 - $4,999 . .	23	1	2	2	7	16	15	11	24	198
$5,000 - $7,999 . .	38	9	2	9	18	10	2	5	8	173
$8,000 - $9,999 . .	50	21	3	5	13	4	3		1	76
$10,000-$10,999 . .	62	10	14		7	7				29
$11,000 and up . .	77	12	2	4	4	2				52
	34. Sociology									
$0	*									1
Less than $100 to $999	*									5
$1,000 - $1,499 . .	*			*		*	*		*	14
$1,500 - $2,499 . .	27		5	9	2	11	9	11	25	55
$2,500 - $2,999 . .	15	2		5	2	7	12	12	44	41
$3,000 - $4,999 . .	22	2	3	5	8	16	12	11	21	169
$5,000 - $7,999 . .	43	5	3	3	25	10	3	2	6	157
$8,000 - $9,999 . .	44	7	5	7	23	9	2	2		43
$10,000-$10,999 . .	*	*	*	*	*		*			17
$11,000 and up . .	67	18	10	2				2		49

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	35. English									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									3
Less than $100 to $999	*				*	*			*	14
$1,000 - $1,499 . .	80	5		5				5	5	20
$1,500 - $2,499 . .	40	4	4	4	3	9	3	3	32	78
$2,500 - $2,999 . .	30		3		3	12	9	15	27	33
$3,000 - $4,999 . .	38	5	2	2	2	21	9	9	12	133
$5,000 - $7,999 . .	64	10	4	1	13	6	1	1		134
$8,000 - $9,999 . .	68	14	4	4	11					28
$10,000-$10,999 . .	*	*								11
$11,000 and up . .	72	7	9	9	2					54
	36. History									
$0	*									5
Less than $100 to $999	78			4	4				15	27
$1,000 - $1,499 . .	74		3			11	3	6	3	35
$1,500 - $2,499 . .	45	1	5		5	9	9	11	15	85
$2,500 - $2,999 . .	24		7	2		15	9	22	22	46
$3,000 - $4,999 . .	36	3	4	2	14	14	3	8	15	118
$5,000 - $7,999 . .	60	8	7	8	11	4	1		1	167
$8,000 - $9,999 . .	53	16	2	7	20	2				45
$10,000-$10,999 . .	*	*								10
$11,000 and up . .	82	11	4	4						28

*Less than one-half of 1 per cent.

TABLE C.2--Continued

Total Income	37. Social Work									Total N
	Per Cent of Total Income from Stipends									
	0	1-9	10-19	20-29	30-49	50-69	70-79	80-89	90+	
$0	*									3
Less than $100 to $999.	*				*	*	*		*	16
$1,000 - $1,499 . .	*			*		*	*		*	11
$1,500 - $2,499 . .	14	2	3	2	7	4	10	12	44	90
$2,500 - $2,999 . .	10	1	1	1	4	25	15	12	30	73
$3,000 - $4,999 . .	12	1			7	26	19	13	22	205
$5,000 - $7,999 . .	23	11	5	8	26	10	6	1	10	186
$8,000 - $9,999 . .	27	6	10	27	13	11	2	1	2	84
$10,000-$10,999 . .	38	10			43			5	5	21
$11,000 and up . .	50	16	16	7	7	3		1		100

*Less than one-half of 1 per cent.

TABLE C.3

FIELD OF STUDY BY ENROLLMENT STATUS AND TOTAL ACADEMIC EXPENSES

(Per Cent)

Field of Study	Enrollment Status																	
	Full Time									Part Time								
	Total Academic Costs						N	NA	Total N	Total Academic Costs						N	NA	Total N
	$0	≥$100 to $299	$300 to $499	$500 to $899	$900 to $1,599	$1,600 and Up				$0	≥$100 to $299	$300 to $499	$500 to $899	$900 to $1,599	$1,600 and Up			
Physical Sciences																		
General physical sciences	-	28	47	12	1	11	72	1	73	1	71	18	8	1	-	73	1	74
All other earth and physical sciences . . .	1	10	16	32	30	11	146	-	146	-	38	19	37	5	-	115	5	120
Astronomy	-	14	14	18	32	22	169	-	169	2	24	27	26	18	3	62	-	62
Chemistry	-	16	25	28	22	8	355	2	357	1	47	27	16	6	2	201	4	205
Physics	1	18	26	26	19	12	300	3	303	1	43	26	20	10	1	176	4	180
Geography	-	10	25	38	22	5	316	-	316	-	44	31	15	8	1	202	5	207
Geology and geophysics. .	-	15	22	31	20	12	350	1	351	-	33	31	22	13	1	128	1	129
Oceanography.	-	22	33	30	10	5	127	1	128	-	35	21	32	9	3	34	-	34
Metallurgy.	-	11	14	38	26	11	73	-	73	2	24	27	37	9	1	120	2	122
Meteorology	2	13	18	33	26	9	175	7	182	-	22	21	33	19	5	58	-	58
Mathematics	-	16	31	20	21	12	250	2	252	2	44	30	16	9	-	244	4	248
Engineering																		
All other engineering . .	1	12	14	16	36	22	309	2	311	2	36	28	25	7	2	296	5	301
Civil engineering	*	8	24	20	30	17	303	4	307	2	35	27	25	11	1	342	8	350
Chemical engineering. . .	-	13	17	23	33	13	409	3	412	2	46	23	21	7	2	292	7	299
Electrical engineering. .	3	13	18	21	26	20	257	1	258	4	39	28	20	8	1	562	12	574
Mechanical engineering. .	1	8	22	22	29	17	296	3	299	1	43	24	25	5	1	515	17	532
Life Sciences																		
All other biology	*	15	33	33	14	5	303	1	304	1	37	28	22	11	2	111	-	111
Anatomy	1	15	21	29	26	8	182	1	183	2	32	36	18	9	2	44	-	44
General biology	-	22	22	27	18	10	466	3	469	2	54	23	13	7	1	300	3	303
Biochemistry.	*	11	21	29	24	14	458	-	458	4	31	27	12	19	6	48	1	49

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*Less than one-half of 1 per cent.

TABLE C.3--Continued

Field of Study	Enrollment Status																	
	Full Time									Part Time								
	Total Academic Costs						N	NA	Total N	Total Academic Costs						N	NA	Total N
	$0	≥$100 to $299	$300 to $499	$500 to $899	$900 to $1,599	$1,600 and Up				$0	≥$100 to $299	$300 to $499	$500 to $899	$900 to $1,599	$1,600 and Up			
Life Sciences--Continued																		
Botany.	*	18	30	32	18	3	394	3	397	-	28	31	34	6	1	176	-	176
Biophysics.	-	14	21	20	28	17	174	-	174	-	21	11	26	26	16	19	-	19
Genetics.	-	18	20	40	18	4	202	-	202	-	42	21	26	8	3	62	1	63
Microbiology.	-	27	19	27	15	13	526	1	527	-	41	31	21	7	1	116	1	117
Pathology	3	16	29	33	14	4	69	1	70	11	41	28	9	7	4	46	-	46
Pharmacology.	-	10	19	31	33	8	189	-	189	-	39	30	9	15	6	33	1	34
Physiology.	1	15	20	32	24	7	363	-	363	-	39	18	28	14	1	79	1	80
Zoology	-	18	31	31	16	4	425	-	425	-	31	30	27	8	3	181	3	184
Agriculture	1	22	40	29	7	2	310	2	312	1	52	30	13	3	-	141	1	142
Forestry.	-	23	36	24	14	3	345	2	347	2	55	22	19	1	1	107	1	108
Behavioral Sciences																		
Psychology.	-	12	25	30	26	7	464	2	466	*	44	26	20	9	*	210	1	211
Anthropology.	-	11	19	24	27	19	403	2	405	-	37	21	25	13	4	175	5	180
Economics	*	21	22	24	21	11	391	4	395	2	40	32	18	6	2	257	6	263
Sociology	-	12	24	30	22	11	298	1	299	-	41	29	16	10	4	240	7	247
Humanities																		
English	-	19	27	27	19	8	211	1	212	*	48	31	15	4	1	268	4	272
History	*	9	30	26	26	9	327	7	334	1	44	32	16	5	2	220	4	224
Social Work																		
Social work.	-	7	23	20	42	9	617	6	623	1	55	19	17	7	1	138	2	140

TABLE C.4

FIELD OF STUDY BY AMOUNT OF FIRST STIPEND

(Per Cent)

Field of Study	Amount of First Stipend										N	NA	Total N
	$0	≥$100 to $999	$1,000 to $1,499	$1,500 to $2,499	$2,500 to $2,999	$3,000 to $4,999	$5,000 to $7,999	$8,000 to $9,999	$10,000 to $10,999	$11,000 and Up			
Physical Sciences													
General physical sciences.	36	25	8	10	1	13	6	1	-	-	157	3	160
All other earth and physical sciences .	31	19	4	14	9	19	3	-	*	*	268	6	274
Astronomy	17	13	6	31	10	21	1	-	-	-	239	-	239
Chemistry	18	15	6	29	12	19	*	-	*	*	572	8	580
Physics	24	12	5	21	13	23	1	*	*	-	492	7	499
Geography	42	15	8	23	6	4	2	-	-	-	543	5	548
Geology and geophysics	27	12	11	27	9	13	1	-	-	-	491	2	493
Oceanography.	11	11	2	32	8	29	5	-	1	-	167	2	169
Metallurgy.	38	21	3	8	4	21	5	*	*	-	198	2	200
Meteorology	20	20	9	12	8	22	7	2	-	-	242	8	250
Mathematics	31	21	5	19	8	13	1	*	-	1	511	7	518
Engineering													
All other engineering	31	22	9	11	8	15	3	1	*	1	618	7	625
Civil engineering . .	37	13	8	16	9	13	3	1	*	*	654	13	667
Chemical engineering.	29	15	4	20	13	18	1	1	-	-	713	10	723
Electrical engineering	45	24	3	10	7	9	2	1	*	*	845	15	860
Mechanical engineering	41	24	4	15	5	8	2	*	*	*	831	21	852
Life Sciences													
All other biology . .	18	7	6	22	21	24	2	-	-	-	429	3	432
Anatomy	17	11	5	18	10	30	8	1	-	-	237	1	238
General biology . . .	27	15	5	13	9	28	2	-	-	-	799	8	807
Biochemistry.	8	14	3	23	18	29	3	1	1	-	520	1	521
Botany.	11	15	5	33	20	14	2	*	*	-	589	3	592
Biophysics.	9	3	4	15	14	46	7	1	*	-	203	-	203
Genetics.	10	9	4	20	23	30	5	-	-	-	282	1	283
Microbioloby.	13	18	6	30	15	15	3	*	-	-	661	3	664
Pathology	27	16	2	3	3	17	26	3	3	-	117	1	118
Pharmacology.	13	7	5	17	14	36	8	*	-	-	226	2	228
Physiology.	14	9	7	21	13	27	8	3	-	-	463	1	464
Zoology	15	11	9	37	12	14	2	-	-	-	622	3	625
Agriculture	24	6	3	24	18	23	2	*	-	*	470	3	473
Forestry.	29	14	9	28	12	8	1	-	*	-	470	3	473
Behavioral Sciences													
Psychology.	33	11	7	24	10	13	1	*	-	-	694	4	698
Anthropology.	33	13	5	24	8	15	1	-	-	*	602	7	609
Economics	38	10	6	21	11	11	2	-	-	-	668	11	679
Sociology	36	13	7	21	8	13	2	*	-	-	551	8	559
Humanities													
English	54	13	4	17	7	5	*	-	-	-	508	7	515
History	53	14	5	18	4	6	-	-	-	-	566	12	578
Social Work													
Social work	23	11	6	29	10	16	4	*	-	-	789	10	799

*Less than one-half of 1 per cent.

TABLE C.5

FIELD OF STUDY BY AMOUNT OF TOTAL STIPENDS HELD

(Per Cent)

Field of Study	Amount of Total Stipends Held										N	NA	Total N
	$0	≥$100 to $999	$1,000 to $1,499	$1,500 to $2,499	$2,500 to $2,999	$3,000 to $4,999	$5,000 to $7,999	$8,000 to $9,999	$10,000 to $10,999	$11,000 and Up			
Physical Sciences													
General physical sciences.	36	22	5	13	1	14	8	1	-	-	157	3	160
All other earth and physical sciences .	31	17	4	10	7	27	3	-	*	*	268	6	274
Astronomy	17	10	4	23	16	29	2	-	-	-	239	-	239
Chemistry	18	10	4	24	14	29	1	-	*	*	572	8	580
Physics	24	10	3	17	13	30	2	*	*	-	492	7	499
Geography	42	13	5	22	8	7	3	-	-	-	543	5	548
Geology and geophysics	27	7	8	26	13	18	2	-	-	-	491	2	493
Oceanography.	11	8	1	23	10	40	7	-	1	-	167	2	169
Metallurgy.	38	20	2	4	5	24	6	*	*	-	198	2	200
Meteorology	20	17	11	9	8	22	11	2	-	-	242	8	250
Mathematics	31	18	4	16	8	19	3	*	-	1	511	7	518
Engineering													
All other engineering	31	21	6	11	8	19	4	1	*	1	618	7	625
Civil engineering . .	37	12	6	12	8	17	6	1	*	*	654	13	667
Chemical engineering	29	14	2	13	13	27	2	1	*	-	713	10	723
Electrical engineering	45	24	3	7	6	11	3	1	*	*	845	15	860
Mechanical engineering	41	23	3	11	5	12	3	*	*	*	831	21	852
Life Sciences													
All other biology. . .	18	4	3	19	21	31	4	-	-	-	429	3	432
Anatomy	17	8	4	14	11	37	10	1	-	-	237	1	238
General biology . . .	27	12	4	12	9	33	2	*	-	-	799	8	807
Biochemistry.	8	10	2	17	21	37	3	1	1	-	520	1	521
Botany.	11	11	4	27	22	22	2	1	*	-	589	3	592
Biophysics.	9	3	2	8	10	57	9	1	*	-	203	-	203
Genetics.	10	6	2	17	22	39	5	*	-	-	282	1	283
Microbiology.	13	11	6	30	16	17	6	*	-	-	661	3	664
Pathology	27	14	2	3	3	15	29	4	3	-	117	1	118
Pharmacology.	13	4	2	14	16	41	10	*	-	-	226	2	228
Physiology.	14	5	5	18	13	33	10	2	*	-	463	1	464
Zoology	15	6	6	33	18	19	3	-	-	-	622	3	625
Agriculture	24	4	2	23	18	26	3	*	-	*	470	3	473
Forestry.	29	10	8	29	13	11	1	-	*	-	470	3	473
Behavioral Sciences													
Psychology.	33	8	6	21	11	18	3	*	-	-	694	4	698
Anthropology.	33	9	5	20	9	21	2	-	-	*	602	7	609
Economics	38	9	5	18	12	15	4	*	-	-	668	11	679
Sociology	36	10	5	18	10	18	3	*	-	*	551	8	559
Humanities													
English	54	11	3	16	7	8	*	-	-	-	508	7	515
History	53	12	4	17	5	8	*	-	-	-	566	12	578
Social Work													
Social work	23	10	5	27	11	18	5	*	-	*	789	10	799

*Less than one-half per cent

TABLE C.6

FIELD OF STUDY BY DURATION OF FIRST STIPEND

(Per Cent)

Field of Study	Duration of First Stipend (Months)													Inapplicable	NA	Total N
	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten	Eleven	Twelve	N			
Physical Sciences																
General physical sciences .	-	15	22	1	2	1	1	1	23	23	2	8	99	61	-	160
All other earth and physical sciences	-	1	4	2	2	2	1	4	23	13	1	46	180	94	-	274
Astronomy	-	5	2	4	3	-	-	6	52	12	*	16	197	42	-	239
Chemistry	*	3	3	3	5	3	1	2	30	18	3	27	464	116	-	580
Physics	*	2	2	2	2	2	1	2	36	13	3	34	372	127	-	499
Geography	-	2	6	5	5	3	1	2	44	20	1	12	304	244	-	548
Geology and geophysics. . .	*	1	5	3	4	1	1	3	47	16	1	17	352	141	-	493
Oceanography.	-	3	2	2	1	3	-	3	36	11	1	39	149	20	-	169
Metallurgy.	1	-	4	7	1	3	1	-	24	7	-	51	121	79	-	200
Meteorology	2	1	2	2	5	3	-	2	16	12	2	54	192	58	-	250
Mathematics	1	5	3	4	4	2	-	4	41	18	1	17	341	177	-	518
Engineering																
All other engineering . . .	-	-	4	5	4	6	1	3	36	13	1	29	416	209	-	625
Civil engineering	-	1	2	5	7	2	1	4	40	16	-	22	414	253	-	667
Chemical engineering. . . .	*	3	3	4	6	3	-	3	36	10	1	30	505	218	-	723
Electrical engineering. . .	-	1	4	7	5	5	2	6	37	10	1	21	457	403	-	860
Mechanical engineering. . .	*	1	2	7	8	4	1	5	40	9	1	21	482	370	-	852
Life Sciences																
All other biology	1	2	2	3	3	3	1	1	20	11	3	52	343	89	-	432
Anatomy	1	2	4	2	5	3	1	1	11	10	3	59	192	46	-	238
General biology	1	5	4	3	6	2	-	3	25	27	2	22	540	267	-	807
Biochemistry.	*	3	3	2	1	3	1	1	17	8	3	58	467	54	-	521
Botany.	-	4	5	2	5	2	1	1	31	17	2	30	515	77	-	592
Biophysics.	1	-	1	2	1	3	1	3	21	10	-	58	183	20	-	203
Genetics.	-	3	4	1	2	3	1	1	14	15	2	54	248	35	-	283
Microbiology.	1	8	3	5	3	2	-	2	22	9	2	44	565	99	-	664
Pathology	-	1	5	-	1	6	-	2	7	4	2	71	82	36	-	118
Pharmacology.	1	1	4	1	2	4	1	1	8	11	3	66	189	39	-	228
Physiology.	-	1	4	2	4	4	1	2	18	7	3	55	393	71	-	464
Zoology	-	4	3	2	7	3	*	2	34	19	2	23	518	107	-	625
Agriculture	*	1	1	1	1	1	1	3	14	7	2	68	351	122	-	473
Forestry.	*	2	5	4	6	4	*	3	24	7	2	42	331	142	-	473
Behavioral Sciences																
Psychology.	*	3	1	2	5	2	2	2	31	21	2	28	453	245	-	698
Anthropology.	-	1	5	5	5	4	1	7	35	17	-	20	393	216	-	609
Economics	1	1	3	3	3	3	1	3	42	15	2	23	411	268	-	679
Sociology	1	2	4	3	6	3	1	3	34	22	1	19	343	216	-	559
Humanities																
English	-	2	3	3	7	2	-	6	48	18	1	8	217	298	-	515
History	1	2	2	5	7	1	*	6	37	23	1	14	270	308	-	578
Social Work																
Social work	-	*	2	3	3	2	*	14	57	11	1	6	598	201	-	799

*Less than one-half of 1 per cent.

TABLE C.7

FIELD OF STUDY BY TYPE OF SECOND STIPEND

(Per Cent)

Field of Study	Type of Second Stipend: Scholarship ≤ Tuition	Fellowship and Cash	Research Assistant	Teaching Assistant	N	NA	No Stipends	No Second Stipends	Total N
Physical Sciences									
General physical sciences	27	64	-	9	22	6	59	73	160
All other earth and physical sciences	26	17	43	13	46	1	87	140	274
Astronomy	22	16	38	25	64	2	40	133	239
Chemistry	15	18	41	26	175	5	108	292	580
Physics	34	15	28	23	100	3	121	275	499
Geography	29	29	22	19	78	6	232	232	548
Geology and geophysics	25	27	25	23	115	4	135	239	493
Oceanography	20	18	51	11	45	-	19	105	169
Metallurgy	32	5	50	14	22	2	75	101	200
Meteorology	29	11	37	23	35	2	52	161	250
Mathematics	34	24	8	34	106	6	165	241	518
Engineering									
All other engineering	45	9	28	19	105	8	191	321	625
Civil engineering	26	20	31	23	107	6	246	308	667
Chemical engineering	34	17	31	18	174	5	212	332	723
Electrical engineering	53	7	24	16	105	11	378	366	860
Mechanical engineering	46	10	24	20	125	4	350	373	852
Life Sciences									
All other biology	13	22	46	19	90	6	81	255	432
Anatomy	12	29	14	45	49	3	39	147	238
General biology	28	26	15	31	144	6	224	433	807
Biochemistry	22	23	34	21	116	4	43	358	521
Botany	19	25	30	26	149	11	68	364	592
Biophysics	16	25	21	39	57	-	18	128	203
Genetics	26	20	31	23	61	2	30	190	283
Microbiology	25	30	20	25	106	5	87	466	664
Pathology	35	35	24	6	17	2	32	67	118
Pharmacology	28	18	28	26	39	1	31	157	228
Physiology	16	28	28	27	113	2	65	284	464
Zoology	16	25	32	27	165	14	97	349	625
Agriculture	33	24	35	9	55	2	111	305	473
Forestry	23	30	29	19	70	6	136	271	473
Behavioral Sciences									
Psychology	23	14	41	21	140	13	234	311	698
Anthropology	27	31	29	12	120	6	204	279	609
Economics	28	21	24	27	116	3	259	301	679
Sociology	23	17	37	22	98	6	208	247	559
Humanities									
English	40	25	4	32	53	7	279	176	515
History	37	29	6	29	52	5	304	217	578
Social Work									
Social work	57	35	8	-	105	8	184	502	799

TABLE C.8

FIELD OF STUDY BY SOURCE OF SECOND STIPEND

(Per Cent)

Field of Study	Source of Second Stipend																				N	NA	Inapplicable	Total N
						Office of Educ.		Public Health Service																
	Atomic Energy Commission	Department of Defense	National Science Foundation	Veterans Administration	NASA	NDEA	Other	NIH Fellow	NIH Training	Other PHS	Other Federal Government	Sub-total Federal Government	Private Foundation/ Philanthropic Orgn.	Industry/Business Firm	Directly from School	School Source Unknown	State or Local Government	Foreign Government	Other	Sub-total Non-federal Government				
Physical Sciences																								
General physical sciences	-	-	77	-	-	-	-	-	-	-	-	77	-	-	5	9	-	-	9	23	22	6	132	160
All other earth and physical sciences	7	9	9	-	-	-	-	-	-	2	2	28	7	11	46	7	2	-	-	72	46	1	227	274
Astronomy	-	8	8	-	2	-	-	-	-	-	3	20	8	-	56	14	2	-	-	80	64	2	173	239
Chemistry	4	3	14	-	1	1	-	2	1	2	1	29	6	12	36	14	1	-	2	71	175	5	400	580
Physics	15	3	9	-	2	3	-	-	-	-	2	34	5	3	42	12	3	-	1	66	100	3	396	499
Geography	-	-	6	-	-	3	-	-	-	-	4	13	17	-	59	5	3	-	4	87	78	6	464	548
Geology and geophysics. . . .	1	2	21	-	-	1	-	-	-	-	3	27	10	3	45	7	6	-	2	73	115	4	374	493
Oceanography. . . .	2	11	18	-	-	4	-	-	2	2	2	42	2	2	36	16	2	-	-	58	45	-	124	169
Metallurgy.	27	-	-	-	-	-	-	-	-	-	-	27	5	18	45	5	-	-	-	73	22	2	176	200
Meteorology	-	20	11	-	-	3	-	-	-	-	17	51	3	3	40	3	-	-	-	49	35	2	213	250
Mathematics	1	3	25	-	-	-	-	-	-	-	1	30	1	5	50	8	5	-	2	70	106	6	406	518
Engineering																								
All other engineering	2	6	7	-	1	-	-	-	-	-	1	16	6	15	41	13	8	-	1	84	105	8	512	625
Civil engineering .	-	7	5	-	-	1	-	-	-	1	-	14	8	8	45	9	9	-	6	86	107	6	554	667
Chemical engineering	2	1	12	-	1	2	1	-	-	1	1	21	2	17	39	17	5	-	-	79	174	5	544	723
Electrical engineering	1	6	3	-	4	-	-	-	-	-	3	16	3	26	40	9	4	-	3	84	105	11	744	860
Mechanical engineering	2	5	3	-	6	2	-	-	1	-	3	22	5	25	40	6	3	-	-	78	125	4	723	852
Life Sciences																								
All other biology .	1	2	19	-	-	1	-	1	2	1	1	29	4	1	39	16	10	-	1	71	90	6	336	432
Anatomy	-	-	2	2	-	-	-	4	22	-	2	33	10	-	41	12	4	-	-	67	49	3	186	238
General biology . .	-	-	22	-	-	3	-	1	8	2	1	37	5	1	40	6	9	-	1	62	144	6	657	807
Biochemistry. . . .	3	-	4	-	-	-	1	6	23	2	3	41	7	-	23	17	8	-	3	59	116	4	401	521

TABLE C.8--Continued

Field of Study	Source of Second Stipend																						
	Atomic Energy Commission	Department of Defense	National Science Foundation	Veterans Administration	NASA	Office of Educ.		Public Health Service			Other Federal Government	Sub-total Federal Government	Private Foundation/ Philanthropic Orgn.	Industry/Business Firm	Directly from School	School Source Unknown	State or Local Government	Foreign Government	Other	Sub-total Non-federal Government	N	NA	Inapplicable	Total N
						NDEA	Other	NIH Fellow	NIH Training	Other PHS														
Life Sciences--Continued																								
Botany	-	1	29	1	-	4	-	1	-	1	3	39	3	1	43	8	5	-	2	61	149	11	432	592
Biophysics . . .	7	-	2	-	2	-	-	5	28	2	-	46	2	-	28	19	4	-	2	54	57	-	146	203
Genetics	3	-	5	-	-	7	2	-	10	2	-	28	2	-	43	23	5	-	-	72	61	2	220	283
Microbiology . .	2	-	22	2	-	1	-	1	13	6	-	46	1	-	38	8	8	-	-	54	106	5	553	664
Pathology. . . .	-	-	-	-	-	-	-	12	24	-	6	41	6	-	47	-	6	-	-	59	17	2	99	118
Pharmacology . .	-	-	3	-	-	-	-	5	21	8	-	36	8	3	23	21	5	-	5	64	39	1	188	228
Physiology . . .	2	-	6	-	1	1	-	7	15	4	3	38	4	4	40	10	4	-	1	62	113	2	349	464
Zoology.	1	-	21	-	-	3	-	3	2	2	2	34	2	-	45	12	7	-	1	66	165	14	446	625
Agriculture. . .	4	-	4	-	-	2	-	-	2	-	7	18	13	5	40	15	4	-	5	82	55	2	416	473
Forestry	1	-	9	1	-	3	1	3	-	-	3	21	13	10	37	11	7	-	-	79	70	6	397	473
Behavioral Sciences																								
Psychology . . .	-	2	4	2	-	2	1	4	1	6	1	24	4	1	50	12	6	-	3	76	140	13	545	698
Anthropology . .	-	-	12	-	-	5	-	4	1	-	4	27	11	1	45	7	7	-	2	73	120	6	483	609
Economics. . . .	-	2	3	-	-	3	-	-	-	-	1	8	7	2	59	12	10	-	3	92	116	3	560	679
Sociology. . . .	-	-	1	-	-	2	-	4	3	2	4	16	9	1	53	12	6	-	2	84	98	6	455	559
Humanities																								
English.	-	2	-	-	-	9	-	-	-	-	-	11	8	-	62	6	8	-	6	89	53	7	455	515
History.	-	-	-	-	-	4	-	-	-	-	-	4	15	4	62	6	6	-	4	96	52	5	521	578
Social Work																								
Social work. . .	-	-	-	2	-	1	1	4	4	-	3	14	28	1	22	6	25	1	4	86	105	8	686	799

TABLE C.9

FIELD OF STUDY BY TYPE OF LOANS USED FOR FINANCING GRADUATE STUDY

(Per Cent)

Field of study	Loans used for financing graduate study								N	NA	Total N
	Tuition deferred for more than three months	Other payment deferred to the university more than three months	Cash borrowed from university	National Defense Education loan	Banks and insurance companies	Family loans which are to be paid	Other specifically education loan	None of the above			
Physical sciences											
General physical sciences	-	-	1	6	5	6	3	83	144	16	160
All other earth and physical sciences .	1	*	-	2	5	7	5	82	258	16	274
Astronomy	*	-	3	3	1	8	1	86	223	16	239
Chemistry	2	*	4	2	4	9	2	83	529	51	580
Physics	2	-	4	3	3	6	2	84	453	46	499
Geography	1	*	6	5	8	10	2	74	479	69	548
Geology and geophysics	2	1	7	3	5	16	2	74	449	44	493
Oceanography	1	-	4	6	5	11	1	76	152	17	169
Metallurgy	-	1	2	1	3	4	3	88	181	19	200
Meteorology	2	*	3	1	3	7	4	83	229	21	250
Mathematics	1	-	1	2	3	7	3	86	472	46	518
Engineering											
All other engineering	2	1	1	1	3	6	5	85	568	57	625
Civil engineering . .	2	1	1	1	5	7	5	82	619	48	667
Chemical engineering .	1	*	2	2	3	6	4	86	661	62	723
Electrical engineering	1	*	2	1	2	4	4	87	798	62	860
Mechanical engineering	2	*	2	1	3	5	5	85	784	68	852
Life sciences											
All other biology . .	2	2	4	3	7	7	2	79	381	51	432
Anatomy	*	-	5	2	7	8	3	79	203	35	238
General biology . . .	2	*	2	4	5	7	2	83	755	52	807
Biochemistry	*	1	4	2	3	10	4	80	477	44	521
Botany	2	*	4	2	5	11	1	80	542	50	592
Biophysics	1	1	4	-	2	4	2	88	182	21	203
Genetics	*	1	5	2	7	8	2	80	260	23	283
Microbiology	1	*	2	1	5	10	3	81	617	47	664
Pathology	-	-	2	-	6	9	3	86	100	18	118
Pharmacology	-	*	5	1	6	9	1	82	201	27	228
Physiology	2	1	4	3	6	9	4	80	403	61	464
Zoology	2	1	4	2	6	10	1	81	562	63	625
Agriculture	1	*	4	5	8	14	3	74	419	54	473
Forestry	*	*	6	6	7	13	2	74	433	40	473

*Less than one-half of 1 per cent.

TABLE C.9--Continued

Field of study	Loans used for financing graduate study								N	NA	Total N
	Tuition deferred for more than three months	Other payment deferred to the university more than three months	Cash borrowed from university	National Defense Education loan	Banks and insurance companies	Family loans which are to be paid	Other specifically education loan	None of the above			
Behavioral sciences											
Psychology	3	*	6	4	5	11	2	75	649	49	698
Anthropology	2	*	9	3	4	9	1	78	535	74	609
Economics	2	1	5	3	6	8	2	78	600	79	679
Sociology	2	1	8	2	7	9	3	76	496	63	559
Humanities											
English	1	-	4	5	6	9	2	79	459	56	515
History	3	1	4	4	4	8	3	79	512	66	578
Social work											
Social work	2	*	3	2	5	8	7	78	743	56	799

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*Less than one-half of 1 per cent.

TABLE C.10

SOURCES OF INCOME AMONG AMERICAN GRADUATE STUDENTS IN THIRTY-SEVEN FIELDS OF STUDY

(Per Cent Reporting Any Income and Median Cash Value among Those Reporting Any)

Field of Study	Total Income (8)		Stipend Income						Other Income								Loans						N
			Total (3)		First (1)		Second (2)		Total (7)		Employment (4)		Spouse (6)		Parents (5)		Total (11)		NDEA (9)		Other Educational (10)		
	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	
General physical science.	98	$6,000	63	$1,800	63	$1,500	16	$400	84	$5,400	72	$5,100	29	$2,900	12	$400	22	$1,200	6	$400	2	$300	170
All other physical sciences	98	6,500	69	2,700	69	2,400	17	600	80	6,000	52	8,000	21	3,600	16	200	17	1,000	1	300	2	400	327
Astronomy	100	4,400	85	2,700	85	2,300	28	700	83	2,500	55	1,500	33	2,700	28	400	14	1,000	2	300	3	700	278
Chemistry	99	4,200	81	2,500	81	2,300	29	700	77	2,400	41	4,600	27	2,700	24	300	16	600	2	500	5	300	686
Physics .	99	4,600	76	2,700	76	2,500	21	700	79	3,000	52	3,100	23	3,300	21	300	15	1,000	2	600	4	300	611
Geography	99	4,900	61	2,100	61	1,800	19	600	89	3,600	57	1,700	34	3,600	23	400	21	800	5	400	7	500	659
Geophysics and geology.	99	4,200	72	2,400	72	2,000	23	900	87	2,600	54	1,500	36	2,700	33	500	19	600	3	500	7	600	574
Oceanography.	99	4,800	87	3,000	87	2,500	24	900	84	2,500	42	1,300	34	2,600	26	200	21	900	4	400	4	200	199

TABLE C.10--Continued

Field of Study	Total Income (8)		Stipend Income						Other Income								Loans						N
			Total (3)		First (1)		Second (2)		Total (7)		Employment (4)		Spouse (6)		Parents (5)		Total (11)		NDEA (9)		Other Educational (10)		
	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	
Metallurgy. .	99	$7,500	61	$2,800	61	$2,400	11	$800	85	$7,200	59	$7,600	22	$3,400	16	$300	22	$1,000	1	$1,000	4	$800	222
Meteorology. .	98	6,400	81	2,500	81	2,400	15	800	86	4,200	34	2,000	26	2,500	19	200	18	700	1	400	6	500	291
Mathematics .	99	4,900	67	2,300	67	2,000	21	600	84	3,800	59	4,500	27	3,000	23	300	16	800	3	500	3	500	588
All other engineering	98	7,300	71	2,500	71	2,000	20	900	85	6,800	63	7,200	19	3,000	18	500	20	1,000	1	800	6	600	796
Civil engineering	98	5,600	66	2,600	66	2,200	17	1,000	83	4,300	63	4,300	23	3,000	18	500	19	1,000	1	300	4	900	937
Chemical engineering	99	5,000	71	2,700	71	2,300	24	800	81	3,400	58	4,100	22	2,800	22	2,800	21	1,000	1	800	7	1,000	949
Electrical engineering. . .	98	8,000	56	2,000	56	1,600	14	600	90	8,000	77	8,000	17	3,000	14	500	19	1,600	1	1,000	3	500	1023

TABLE C.10--Continued

Field of Study	Total Income (8)		Stipend Income						Other Income								Loans						N
			Total (3)		First (1)		Second (2)		Total (7)		Employment (4)		Spouse (6)		Parents (5)		Total (11)		NDEA (9)		Other Educational (10)		
	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	
Mechanical engineering. . .	98	$7,200	60	$1,800	60	$1,500	16	$1,000	89	$7,000	72	$7,700	18	$3,000	17	$800	19	$1,000	1	$400	5	$600	1,068
All other biological sci.	99	4,200	84	2,800	84	2,600	22	1,000	73	2,200	27	2,000	36	2,400	23	300	21	800	4	500	6	500	550
Anatomy .	99	4,400	84	3,200	84	2,900	20	900	73	2,000	34	1,300	29	3,200	25	400	14	700	2	200	5	300	279
Biological sci., general.	99	4,500	71	2,900	71	2,500	18	600	84	2,800	46	3,500	33	3,100	24	300	13	700	3	400	2	300	894
Biochemistry. .	99	3,800	92	2,800	92	2,700	21	700	70	2,100	25	1,000	33	2,900	31	400	20	800	2	600	7	700	674
Botany. .	99	3,700	87	2,500	87	2,300	26	600	76	2,100	30	1,200	37	3,000	23	400	18	1,000	2	700	5	400	702
Biophysics . .	99	4,600	91	3,400	91	3,000	27	800	75	2,000	23	1,100	36	3,100	30	200	15	800	-	-	3	300	236
Genetics.	100	4,100	91	3,000	91	2,800	23	700	66	2,000	25	1,400	35	2,700	23	300	16	700	1	800	5	200	394

TABLE C.10--Continued

Field of Study	Total Income (8)		Stipend Income						Other Income								Loans						N
			Total (3)		First (1)		Second (2)		Total (7)		Employment (4)		Spouse (6)		Parents (5)		Total (11)		NDEA (9)		Other Educational (10)		
	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	
Microbiology.	99	$3,900	87	$2,400	87	$2,200	16	$800	77	$2,500	32	$1,600	36	$3,600	31	$400	16	$1,000	1	$400	5	$600	799
Pathology	98	7,100	75	4,500	75	3,800	18	1,300	72	5,000	11	400	23	3,500	11	400	16	2,000	1	500	3	600	167
Pharmacology .	99	4,900	88	3,100	88	3,000	19	800	75	2,600	31	2,300	35	3,400	26	400	14	1,000	1	800	3	600	281
Physiology. .	99	4,700	86	3,000	86	2,700	23	800	73	2,200	30	1,800	29	2,900	28	400	16	1,000	2	400	5	700	564
Zoology .	98	3,800	84	2,400	84	2,200	26	700	81	2,100	35	1,000	38	3,400	31	300	18	700	4	500	3	300	695
Agriculture . .	99	4,000	80	2,800	80	2,700	12	600	72	1,900	32	2,000	32	2,100	21	300	19	800	4	500	4	500	680
Forestry.	99	3,900	73	2,300	73	2,100	19	800	83	2,700	53	1,700	34	2,500	27	400	21	700	5	500	6	400	599
Psychology. . .	99	4,600	64	2,400	64	2,200	20	700	90	3,000	55	1,600	38	3,600	34	400	23	800	5	600	6	400	772
Anthropology .	99	4,200	66	2,500	66	2,200	21	700	89	2,800	46	1,200	37	3,900	33	500	20	600	3	800	8	500	684

TABLE C.10--Continued

Field of Study	Total Income (8)		Stipend Income						Other Income								Loans						N
			Total (3)		First (1)		Second (2)		Total (7)		Employment (4)		Spouse (6)		Parents (5)		Total (11)		NDEA (9)		Other Educational (10)		
	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	Per Cent	Median	
Economics	98	$4,500	65	$2,500	65	$2,300	18	600	85	$3,000	54	$2,000	32	$2,600	25	$ 500	22	$ 700	3	$ 800	5	$ 500	859
Sociology	98	4,600	62	2,400	62	2,200	18	600	87	3,400	56	2,000	32	3,300	27	400	24	700	2	500	10	300	659
English .	98	4,600	46	2,000	46	2,000	12	400	92	4,200	59	3,500	34	5,000	31	400	19	900	3	600	5	300	546
History .	97	4,200	46	1,800	46	1,600	9	400	93	3,500	61	2,000	30	4,000	31	500	20	800	5	600	7	500	614
Social work . .	98	4,800	76	2,300	76	2,100	14	600	86	3,400	56	1,500	34	5,000	23	400	20	1,000	2	500	7	700	863

TABLE C.11

EXPENSES OF AMERICAN GRADUATE STUDENTS IN THIRTY-SEVEN FIELDS OF STUDY

(Per Cent Reporting Any Expense and Median Value of Expense among Those Reporting Any)

Field of Study	Total Expenses (30)		Academic Expenses								Other Expenses								N
			Total Academic Expenses (14)		Tuition and Fees Covered by Stipend (06)		Total Tuition Fees (10)		Other Academic Expenses (12)		Total Other Expenses (24)		Living (16)		Health (20)		Trans-portation (18)		
	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	
Physical science, general	98	$5,200	98	$200	63	$200	95	$200	91	$100	98	$4,900	98	$3,000	88	$300	94	$400	170
Physical science, all other	98	5,600	97	500	66	500	94	400	92	100	98	4,800	98	3,000	82	200	91	400	327
Astronomy . .	100	4,100	99	800	85	700	97	700	96	100	100	3,400	99	2,200	80	100	94	300	278
Chemistry . .	99	4,000	98	400	80	400	96	300	94	100	99	3,200	98	2,000	98	2,000	92	300	686
Physics . . .	99	4,400	98	400	74	300	95	300	94	100	99	3,600	98	2,300	81	200	91	400	611
Geography . .	99	4,600	98	500	61	300	94	300	95	100	99	3,900	98	2,500	81	100	91	300	659
Geology-geophysics. .	99	4,300	99	500	71	300	97	300	98	100	99	3,500	99	2,400	82	200	95	300	574
Oceanography .	99	4,500	99	400	86	300	97	300	96	100	99	3,900	99	2,500	85	200	95	400	199
Metallurgy . .	99	6,200	98	500	61	400	96	400	93	100	99	5,600	99	3,300	86	200	90	400	222

TABLE C.11--Continued

Field of Study	Total Expenses (30)		Academic Expenses								Other Expenses								N
			Total Academic Expenses (14)		Tuition and Fees Covered by Stipend (06)		Total Tuition Fees (10)		Other Academic Expenses (12)		Total Other Expenses (24)		Living (16)		Health (20)		Trans- portation (18)		
	Per Cent	Me- dian	Per Cent	Me- dian	Per Cent	Me- dian	Per Cent	Me- dian	Per Cent	Me- dian	Per Cent	Me- dian	Per Cent	Me- dian	Per Cent	Me- dian	Per Cent	Me- dian	
Meteorology .	99	$5,800	97	$ 600	80	$600	92	$600	92	$600	98	$500	98	$3,300	79	$200	90	$400	291
Mathematics .	99	4,400	98	400	65	300	94	300	95	100	99	3,900	98	2,400	82	200	91	300	588
All other engineering .	99	6,000	97	600	70	700	95	500	91	100	98	5,400	98	3,200	83	200	92	500	796
Civil engin- eering. . . .	98	5,100	97	600	65	600	95	500	94	100	98	4,300	98	2,600	83	200	90	400	937
Chemical engineering .	99	4,700	98	500	70	600	96	400	95	100	99	3,900	98	2,400	82	200	89	300	949
Electrical engineering .	98	6,500	95	400	56	400	93	300	81	100	98	6,000	97	3,400	84	300	93	500	1,023
Mechanical engineering .	98	6,000	97	500	59	400	95	400	91	100	98	5,500	97	3,100	83	300	91	500	1,068
All other bio- logical sci..	99	4,100	98	500	82	300	95	300	97	100	99	3,400	98	2,300	88	100	92	300	550
Anatomy . . .	99	4,200	98	500	80	400	94	400	92	100	99	3,400	98	2,500	78	200	90	300	279

TABLE C.11--Continued

Field of Study	Total Expenses (30)		Academic Expenses								Other Expenses								N
			Total Academic Expenses (14)		Tuition and Fees Covered by Stipend (06)		Total Tuition Fees (10)		Other Academic Expenses (12)		Total Other Expenses (24)		Living (16)		Health (20)		Trans-portation (18)		
	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	
Biology, general . . .	99	$4,100	98	$400	65	$300	90	$300	94	$100	99	$3,600	98	$2,300	84	$200	94	$300	894
Biochemistry .	100	3,800	99	600	89	400	96	500	95	100	100	2,900	100	2,000	79	100	90	300	674
Botany	99	3,700	99	500	85	300	96	300	98	100	99	3,000	99	2,100	84	100	92	300	702
Biophysics . .	99	4,500	99	800	87	700	95	600	92	100	99	3,600	99	2,500	81	100	94	300	236
Genetics . . .	100	4,000	98	600	86	500	94	400	95	100	100	3,400	100	2,300	85	200	92	300	394
Microbiology .	99	3,900	99	500	84	400	96	400	92	100	99	3,200	99	2,200	83	100	90	300	799
Pathology . .	98	6,500	93	400	68	400	86	400	88	100	98	5,600	98	3,500	83	200	91	400	167
Pharmacology .	99	4,800	99	700	87	500	97	500	96	100	99	3,900	99	2,600	83	200	92	300	281
Physiology . .	99	4,500	99	600	81	400	93	400	95	100	99	3,800	99	2,500	81	200	91	300	564
Zoology . . .	100	3,700	99	400	82	300	96	300	97	100	99	3,000	99	2,000	81	200	90	300	695

TABLE C.11--Continued

Field of Study	Total Expenses (30)		Academic Expenses								Other Expenses								N
			Total Academic Expenses (14)		Tuition and Fees Covered by Stipend (06)		Total Tuition Fees (10)		Other Academic Expenses (12)		Total Other Expenses (24)		Living (16)		Health (20)		Trans-portation (18)		
	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	Per Cent	Me-dian	
Agriculture .	99	$3,800	98	$400	77	$300	95	$300	95	$100	99	$3,300	99	$2,200	88	$200	92	$300	680
Forestry . . .	99	3,900	99	400	72	300	95	300	96	100	99	3,400	99	2,200	89	100	94	300	599
Psychology . .	99	4,500	99	500	64	400	96	300	97	100	99	3,700	97	2,500	83	200	92	300	772
Anthropology .	99	4,200	99	600	65	500	97	400	97	100	99	3,300	98	2,300	77	200	89	300	684
Economics . .	99	4,400	98	400	64	400	94	300	95	100	99	3,600	98	2,500	80	200	89	300	859
Sociology . .	98	4,400	98	500	61	400	94	300	97	100	98	3,600	98	2,400	84	200	89	300	659
English . . .	99	4,100	98	300	45	300	96	200	96	100	99	3,600	98	2,400	79	200	89	300	546
History . . .	98	4,100	97	400	46	300	95	300	94	100	97	3,500	96	2,200	76	200	89	300	614
Social work .	98	4,500	98	700	75	600	96	600	91	100	98	3,900	98	2,500	85	200	93	300	863

TABLE D.1

FIELD OF STUDY BY HIGHEST DEGREE HELD

(Per Cent)

Field of Study	Highest Degree Held					N	NA	Total N
	Bachelor's (Undergraduate)	First Professional	Master's	Doctorate	None			
Physical Sciences								
General physical sciences	77	1	23	-	-	160	-	160
All other earth and physical sciences	76	-	24	-	-	273	1	274
Astronomy	65	-	35	-	-	238	1	239
Chemistry	78	-	21	-	-	579	1	580
Physics	65	-	34	-	-	499	-	499
Geography	62	1	37	-	-	548	-	548
Geology and geophysics	66	-	33	-	-	493	-	493
Oceanography	56	-	43	-	1	169	-	169
Metallurgy	67	-	32	-	-	200	-	200
Meteorology	68	-	32	-	-	250	-	250
Mathematics	68	-	32	-	-	518	-	518
Engineering								
All other engineering	67	-	32	-	1	624	1	625
Civil engineering	73	1	26	-	-	666	1	667
Chemical engineering	71	-	28	-	1	723	-	723
Electrical engineering	73	-	26	-	1	858	2	860
Mechanical engineering	73	-	26	-	-	851	1	852
Life Sciences								
All other biology	58	1	40	-	1	431	1	432
Anatomy	60	10	29	-	-	238	-	238
General biology	82	-	17	-	-	805	2	807
Biochemistry	71	4	24	-	1	521	-	521
Botany	54	-	45	-	-	592	-	592
Biophysics	70	2	28	-	-	203	-	203
Genetics	48	-	51	-	-	283	-	283
Microbiology	69	2	28	-	-	663	1	664
Pathology	20	61	18	-	-	118	-	118
Pharmacology	56	9	35	-	-	228	-	228
Physiology	51	10	39	-	-	464	-	464
Zoology	58	-	42	-	-	624	1	625
Agriculture	59	-	41	-	-	472	1	473
Forestry	67	-	32	-	-	471	2	473
Behavioral Sciences								
Psychology	64	1	35	-	-	698	-	698
Anthropology	70	1	29	-	-	609	-	609
Economics	60	1	39	-	-	677	2	679
Sociology	62	2	36	-	-	559	-	559
Humanities								
English	71	1	28	-	-	515	-	515
History	60	1	39	-	-	578	-	578
Social Work								
Social work	81	2	17	-	-	797	2	799

TABLE D.2

FIELD OF STUDY BY NEXT DEGREE EXPECTED

(Per Cent)

Field of Study	Next Degree Expected					N	NA	Total N
	Bachelor's (Undergraduate)	First Professional	Master's	Doctorate	None			
Physical Sciences								
General physical sciences	1	1	82	16	1	158	2	160
All other earth and physical sciences . .	-	1	60	39	1	274	-	274
Astronomy	-	-	36	64	-	238	1	239
Chemistry	-	1	43	56	-	574	6	580
Physics	1	1	47	52	-	499	-	499
Geography	-	1	62	36	1	539	9	548
Geology and geophysics.	-	-	53	46	1	492	1	493
Oceanography	1	-	39	59	1	169	-	169
Metallurgy	-	-	60	40	-	200	-	200
Meteorology	2	-	60	35	2	248	2	250
Mathematics	-	1	63	34	2	515	3	518
Engineering								
All other engineering .	-	1	63	34	2	622	3	625
Civil engineering . . .	-	-	73	25	2	667	-	667
Chemical engineering .	1	-	52	46	1	720	3	723
Electrical engineering	1	1	72	24	2	857	3	860
Mechanical engineering	1	1	72	24	2	846	6	852
Life Sciences								
All other biology . . .	-	1	47	50	2	431	1	432
Anatomy	-	7	30	62	-	236	2	238
General biology	-	1	73	24	1	802	5	807
Biochemistry	-	13	26	61	1	520	1	521
Botany	-	-	43	55	1	591	1	592
Biophysics	-	1	22	76	-	201	2	203
Genetics	-	-	29	70	-	283	-	283
Microbiology	-	11	51	37	1	661	3	664
Pathology	-	8	39	45	9	116	2	118
Pharmacology	-	4	25	70	-	225	3	228
Physiology	-	2	27	71	-	463	1	464
Zoology	-	1	47	51	1	622	3	625
Agriculture	-	1	54	44	1	470	3	473
Forestry	-	1	60	38	1	470	3	473
Behavioral Sciences								
Psychology	-	-	50	49	-	696	2	698
Anthropology	-	-	50	50	-	602	7	609
Economics	-	-	48	51	1	673	6	679
Sociology	-	1	57	41	1	557	2	559
Humanities								
English	-	1	72	27	-	511	4	515
History	-	2	59	38	2	576	2	578
Social Work								
Social work	-	1	86	9	3	784	15	799

TABLE D.3

FIELD OF STUDY BY HIGHEST DEGREE EXPECTED

(Per Cent)

Field of Study	Highest Degree Expected					N	NA	Total N
	Bachelor's (Under graduate)	First Professional	Master's	Doctorate	None			
Physical Sciences								
General physical sciences	-	-	37	63	-	157	3	160
All other earth and physical sciences . .	-	1	33	66	-	273	1	274
Astronomy	-	-	6	94	-	236	3	239
Chemistry	-	1	16	83	-	571	9	580
Physics	-	-	13	87	-	494	5	499
Geography	-	1	23	76	-	529	19	548
Geology and geophysics	-	-	16	84	-	489	4	493
Oceanography	-	-	9	90	-	169	-	169
Metallurgy	-	-	26	73	-	198	2	200
Meteorology	-	-	35	65	-	247	3	250
Mathematics	-	1	29	70	-	506	12	518
Engineering								
All other engineering .	-	1	34	64	-	609	16	625
Civil engineering . . .	-	1	50	49	-	655	12	667
Chemical engineering .	-	-	27	73	-	718	5	723
Electrical engineering	-	1	44	54	-	838	22	860
Mechanical engineering	1	1	46	53	-	837	15	852
Life Sciences								
All other biology . . .	-	1	15	84	-	425	7	432
Anatomy	-	11	8	81	-	237	1	238
General biology	-	2	27	71	-	785	22	807
Biochemistry	-	13	6	81	-	519	2	521
Botany	-	-	10	89	-	578	14	592
Biophysics	-	-	3	96	-	202	1	203
Genetics	-	1	6	93	-	283	-	283
Microbiology	1	12	16	72	-	653	11	664
Pathology	-	14	16	71	-	116	2	118
Pharmacology	-	4	6	90	-	226	2	228
Physiology	-	4	5	91	-	459	5	464
Zoology	-	2	9	89	-	618	7	625
Agriculture	-	1	22	77	-	468	5	473
Forestry	-	-	28	71	-	467	6	473
Behavioral Sciences								
Psychology	-	-	9	91	-	687	11	698
Anthropology	-	-	6	94	-	588	21	609
Economics	-	-	20	79	-	673	6	679
Sociology	-	1	17	82	-	554	5	559
Humanities								
English	-	1	30	69	-	501	14	515
History	1	2	18	79	-	572	6	578
Social Work								
Social work	-	1	66	33	-	753	46	799

TABLE D.4

FIELD OF STUDY BY ENROLLMENT STATUS

(Per Cent)

Field of Study	Enrollment Status		N	NA	Total N
	Full Time	Part Time			
Physical Sciences					
General physical sciences	50	50	147	13	160
All other earth and physical sciences .	55	45	266	8	274
Astronomy	73	27	231	8	239
Chemistry	64	36	562	18	580
Physics	63	37	483	16	499
Geography	60	40	523	25	548
Geology and geophysics	73	27	480	13	493
Oceanography	79	21	162	7	169
Metallurgy	37	63	195	5	200
Meteorology	76	24	240	10	250
Mathematics	50	50	500	18	518
Engineering					
All other engineering	51	49	612	13	625
Civil engineering	47	53	657	10	667
Chemical engineering	58	42	711	12	723
Electrical engineering	31	69	832	28	860
Mechanical engineering	36	64	831	21	852
Life Sciences					
All other biology	73	27	415	17	432
Anatomy	81	19	227	11	238
General biology	61	39	772	35	807
Biochemistry	90	10	507	14	521
Botany	69	31	573	19	592
Biophysics	90	10	193	10	203
Genetics	76	24	265	18	283
Microbiology	82	18	644	20	664
Pathology	60	40	116	2	118
Pharmacology	85	15	223	5	228
Physiology	82	18	443	21	464
Zoology	70	30	609	16	625
Agriculture	69	31	454	19	473
Forestry	76	24	455	18	473
Behavioral Sciences					
Psychology	69	31	677	21	698
Anthropology	69	31	585	24	609
Economics	60	40	658	21	679
Sociology	55	45	546	13	559
Humanities					
English	44	56	484	31	515
History	60	40	558	20	578
Social Work					
Social work	82	18	763	36	799

TABLE D.5

FIELD OF STUDY BY HOURS OF STUDY A WEEK

(Per Cent)

Field of Study	Hours of Study a Week									N	NA	Total N
	None	Less Than 10	10-19	20-29	30-39	40-49	50-59	60-69	More Than 69			
Physical Sciences												
General physical sciences	1	18	21	6	10	11	16	11	5	148	12	160
All other earth and physical sciences	-	18	17	7	7	17	15	11	7	271	3	274
Astronomy	1	1	8	11	12	22	20	14	11	237	2	239
Chemistry	-	9	12	10	9	15	19	15	12	576	4	580
Physics	-	6	15	10	12	15	19	14	9	492	7	499
Geography	-	11	13	14	13	17	13	11	7	543	5	548
Geology and geophysics	-	2	10	9	9	13	20	21	15	492	1	493
Oceanography	-	1	5	7	13	19	24	17	15	167	2	169
Metallurgy	-	16	21	17	11	10	11	10	5	199	1	200
Meteorology	-	2	7	13	12	17	23	16	10	248	2	250
Mathematics	-	15	17	13	13	18	12	7	5	513	5	518
Engineering												
All other engineering	-	13	21	12	7	11	17	10	7	618	7	625
Civil engineering .	-	11	20	13	14	11	14	10	7	663	4	667
Chemical engineering	-	12	17	9	8	14	18	14	8	718	5	723
Electrical engineering	-	22	25	17	11	9	7	4	5	846	14	860
Mechanical engineering	-	17	27	15	9	12	8	8	3	847	5	852
Life Sciences												
All other biology. .	-	3	7	11	9	14	22	22	12	429	3	432
Anatomy	-	3	5	9	9	13	16	24	22	237	1	238
General biology . .	1	8	13	13	9	13	16	14	14	794	13	807
Biochemistry	-	1	4	3	9	14	25	23	21	516	5	521
Botany	-	4	7	9	15	12	20	17	16	590	2	592
Biophysics	-	1	3	3	7	19	25	24	18	203	-	203
Genetics	-	3	7	8	9	18	19	18	17	279	4	283
Microbiology	-	3	10	8	8	22	16	17	17	662	2	664
Pathology	-	7	14	16	9	13	11	14	16	116	2	118
Pharmacology	-	2	4	7	7	13	20	28	18	227	1	228
Physiology	-	3	4	8	9	14	25	23	15	461	3	464
Zoology	-	3	9	11	14	17	20	14	12	623	2	625
Agriculture	-	7	11	7	11	13	17	22	11	461	12	473
Forestry	-	5	6	7	9	20	23	17	12	461	12	473
Behavioral Sciences												
Psychology	-	8	10	13	14	17	21	12	6	689	9	698
Anthropology	-	6	9	15	16	19	14	15	7	601	8	609
Economics	-	9	13	15	12	16	15	12	6	669	10	679
Sociology	-	10	15	14	14	15	14	12	5	554	5	559
Humanities												
English	-	14	20	15	13	15	12	7	4	504	11	515
History	-	10	15	11	13	14	16	15	7	575	3	578
Social Work												
Social work	-	9	8	9	14	21	23	13	4	788	11	799

TABLE D.6

FIELD OF STUDY BY YEARS ELAPSED BETWEEN RECEIPT OF BACHELOR'S DEGREE AND START OF GRADUATE STUDY

(Per Cent)

Field of Study	Years Elapsed							N	Inapplicable	NA	Total N
	Less Than One	One	Two	Three	Four	Five to Nine	Ten or More				
Physical Sciences											
General physical sciences	46	12	10	9	3	10	10	156	-	4	160
All other earth and physical sciences	57	11	7	7	4	10	4	272	1	1	274
Astronomy	76	6	5	2	1	6	4	238	1	-	239
Chemistry	69	7	6	5	3	5	5	577	-	3	580
Physics	79	6	4	3	2	4	2	496	3	-	499
Geography	67	6	7	6	2	8	4	540	1	7	548
Geology and geophysics	74	5	4	5	4	5	2	490	1	2	493
Oceanography	67	10	5	2	5	6	4	167	2	-	169
Metallurgy	63	8	5	6	4	12	2	200	-	-	200
Meteorology	47	7	7	5	8	20	5	237	2	11	250
Mathematics	67	8	5	5	4	6	4	512	2	4	518
Engineering											
All other engineering .	56	8	8	6	6	10	6	615	5	5	625
Civil engineering . . .	59	9	7	6	6	8	4	661	3	3	667
Chemical engineering .	67	8	8	6	3	5	2	711	8	4	723
Electrical engineering	63	10	7	5	4	8	4	839	13	8	860
Mechanical engineering	52	11	8	6	5	12	5	844	4	4	852
Life Sciences											
All other biology . . .	64	9	7	4	5	8	3	420	5	7	432
Anatomy	61	9	9	3	3	7	7	230	7	1	238
General biology	57	7	6	6	2	11	12	794	4	9	807
Biochemistry	79	5	3	4	2	6	1	508	9	4	521
Botany	71	8	5	3	2	6	5	586	5	1	592
Biophysics	76	6	5	3	5	3	3	196	2	5	203
Genetics	73	6	4	4	3	6	3	279	2	2	283
Microbiology	65	6	9	4	4	5	7	653	7	4	664
Pathology	51	5	9	3	8	17	7	103	14	1	118
Pharmacology	62	9	8	6	6	7	3	217	5	6	228
Physiology	64	6	8	8	4	7	4	453	8	3	464
Zoology	75	7	5	5	3	3	2	617	4	4	625
Agriculture	64	5	8	7	4	10	4	468	2	3	473
Forestry	61	6	7	7	3	9	6	467	2	4	473
Behavioral Sciences											
Psychology	73	7	5	3	2	5	4	689	3	6	698
Anthropology	64	8	6	4	3	8	7	600	2	7	609
Economics	62	8	7	5	4	7	7	669	2	8	679
Sociology	65	8	6	4	3	8	6	550	1	8	559
Humanities											
English	54	14	8	5	3	9	7	504	3	8	515
History	63	9	7	6	3	8	4	569	2	7	578
Social Work											
Social work	34	13	11	7	3	11	22	775	2	22	799

TABLE D.7

FIELD OF STUDY BY PROGRESS IN ADVANCED STUDY

(Per Cent)

Field of Study	Progress in Advanced Study: Completed Less Than One Full Year of Work on Advanced Degree	One or More Years Work But No Doctorate by June, 1963	All Doctoral Work Completed by June, 1963	N	NA	Total N
Physical Sciences						
General physical sciences	55	45	-	154	6	160
All other earth and physical sciences	36	60	4	273	1	274
Astronomy	22	73	5	239	-	239
Chemistry	27	69	4	575	5	580
Physics	25	71	4	497	2	499
Geography	28	71	1	540	8	548
Geology and geophysics	19	77	4	485	8	493
Oceanography	17	82	2	169	-	169
Metallurgy	33	64	3	199	1	200
Meteorology	30	67	2	250	-	250
Mathematics	36	62	2	515	3	518
Engineering						
All other engineering	36	62	2	622	3	625
Civil engineering	44	54	2	644	23	667
Chemical engineering	36	62	2	716	7	723
Electrical engineering	45	54	2	848	12	860
Mechanical engineering	46	53	1	842	10	852
Life Sciences						
All other biology	24	72	4	429	3	432
Anatomy	21	75	4	238	-	238
General biology	39	60	2	796	11	807
Biochemistry	20	74	6	521	-	521
Botany	23	73	4	592	-	592
Biophysics	15	82	3	203	-	203
Genetics	21	73	6	280	3	283
Microbiology	30	66	4	659	5	664
Pathology	24	70	5	111	7	118
Pharmacology	18	75	7	228	-	228
Physiology	16	79	5	461	3	464
Zoology	21	75	5	623	2	625
Agriculture	31	67	2	471	2	473
Forestry	32	65	3	463	10	473
Behavioral Sciences						
Psychology	27	68	4	693	5	698
Anthropology	24	74	2	607	2	609
Economics	32	65	3	676	3	679
Sociology	32	65	2	557	2	559
Humanities						
English	45	53	2	506	9	515
History	33	65	2	573	5	578
Social Work						
Social work	36	62	2	776	23	799

TABLE D.8

FIELD OF STUDY BY UNDERGRADUATE GRADE POINT AVERAGE

(Per Cent)

Field of Study	Undergraduate Grade Point Average									N	Inap-pli-cable	NA	Total N
	A	A-	B+	B	B-	C+	C	C-	D+ or Less				
Physical Sciences													
General physical sciences	3	9	13	19	28	22	5	-	-	158	1	1	160
All other earth and physical sciences	7	11	23	16	24	14	5	1	-	271	3	-	274
Astronomy	9	20	22	22	17	7	2	1	*	234	5	-	239
Chemistry	5	15	22	20	16	16	5	1	-	576	4	-	580
Physics	8	25	26	19	14	7	2	-	-	490	9	-	499
Geography	4	14	19	20	22	15	6	1	-	538	10	-	548
Geology and geophysics	3	5	19	19	25	21	7	1	-	480	13	-	493
Oceanography	1	11	30	20	16	17	3	1	-	167	2	-	169
Metallurgy	2	11	26	19	25	12	7	-	-	198	2	-	200
Meteorology	3	16	23	21	18	14	3	1	-	243	7	-	250
Mathematics	7	21	23	21	18	7	2	1	-	510	8	-	518
Engineering													
All other engineering .	6	15	24	18	23	11	3	1	-	604	21	-	625
Civil engineering . . .	5	13	21	17	26	15	4	1	-	659	8	-	667
Chemical engineering .	8	20	28	16	18	8	2	*	-	711	12	-	723
Electrical engineering	6	18	26	18	20	10	3	*	-	841	19	-	860
Mechanical engineering	4	16	24	21	21	10	3	*	-	839	12	1	852
Life Sciences													
All other biology . . .	1	10	19	23	25	19	4	*	-	420	12	-	432
Anatomy	3	12	23	25	21	13	3	-	*	224	14	-	238
General biology	2	12	21	19	21	18	6	*	*	793	13	1	807
Biochemistry	6	16	24	21	19	11	3	*	*	503	18	-	521
Botany	3	11	20	20	21	18	7	*	-	578	14	-	592
Biophysics	6	18	32	20	16	6	2	*	-	196	7	-	203
Genetics	6	20	26	22	16	7	3	1	-	276	7	-	283
Microbiology	2	9	16	29	19	20	4	*	-	650	14	-	664
Pathology	2	19	23	29	13	10	3	-	-	90	27	1	118
Pharmacology	5	20	26	19	20	9	1	-	-	214	14	-	228
Physiology	4	15	23	22	18	14	3	*	-	445	19	-	464
Zoology	2	13	22	24	19	15	4	*	*	616	9	-	625
Agriculture	2	11	25	19	25	15	3	*	-	467	6	-	473
Forestry	2	8	24	16	25	19	5	1	-	464	9	-	473
Behavioral Sciences													
Psychology	5	14	29	19	19	10	3	1	-	685	13	-	698
Anthropology	6	20	27	20	14	11	2	1	*	594	15	-	609
Economics	4	16	26	15	21	13	4	*	-	668	11	-	679
Sociology	3	16	25	21	18	13	3	1	*	550	9	-	559
Humanities													
English	5	19	29	21	13	9	2	*	-	499	16	-	515
History	6	20	26	21	15	9	3	1	-	571	7	-	578
Social Work													
Social work	2	10	21	22	21	17	6	1	*	779	20	-	799

*Less than one-half of 1 per cent.

TABLE D.9

FIELD OF STUDY BY CURRENT FIELD OF STUDY

(Per Cent)

Field of Study	Current Field of Study																				
	General Physical Sciences	All Other Earth and Phy. Sci.	Astronomy	Chemistry	Physics	Geography	Geology and Geophysics	Oceanography	Metallurgy	Meteorology	Mathematics and Statistics	General and Other Engineer.	Aeronaut. Eng.	Civil Eng.	Chem. Eng.	Elect. Eng.	Eng. Sci., Phys., Mechanics	Industrial Eng.	Mechanical Eng.	Metallurg. Eng.	Mining Eng.
Physical Sciences																					
Gen. physical sciences	24	2		11	7		1	1			2										
All other earth and physical sciences .	1	25		14	8	*	1		*		9	4	*	*	9	5	16		*		1
Astronomy	*	*	97		*	*											*				
Chemistry	*			94			*								*						
Physics	*	*	*	*	95		*			*	1				*	*	1		*		
Geography	*	1	*			94															
Geology and geophysics		3				1	92	1		1	*										2
Oceanography				2			4	85													
Metallurgy			*		*				52	*	*				*				1	43	
Meteorology					*		*	2		96	*	*								*	
Mathematics			*	*	1		*				90					1	*	*	*		
Engineering																					
All other engineering		*		2	3			*	2	*	1	13	20	5	1	3	15	16	5	8	2
Civil engineering . .	*	*							*		*	1	*	89	*		7	*	*		*
Chemical engineering	*			*					1		*	1	*	*	94	*	1	1	*	1	
Electrical engineering	*				1						*	1				94	2		2		
Mechanical engineering	*				*		*		*		*	2	1	*		*	7	1	86	2	
Life Sciences																					
All other biology . .														*							
Anatomy																					
General biology . . .						*													*		
Biochemistry	*	*		2							*										
Botany		*				*									*						
Biophysics	*			*	2						1										
Genetics						*					*										
Microbiology														*							
Pathology																					
Pharmacology	4			*																	
Physiology				*	*																
Zoology	*	*					*				*										
Agriculture		*			*					1	*			1							
Forestry		*		5	*						*	1		*					*		
Behavioral Sciences																					
Psychology											*										
Anthropology		2					*														
Economics											*										
Sociology																					
Humanities																					
English																					
History					*																
Social Work																					
Social work																			*		

*Less than one-half of 1 per cent.

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TABLE D.9--Continued

Field of Study	Current Field of Study															
	All Other Biological Sciences	Anatomy, Histology	Gen. Biology	Biochemistry	Gen. Botany	Biophysics	Entomology	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Zoology	Agriculture	Forestry	All Other Health Fields
Physical Sciences																
General physical sciences	2		2		1							1	1			
All other earth and physical sciences					*	*						1				1
Astronomy																
Chemistry				2												*
Physics				*												*
Geography												*				
Geology and geophysics	*															
Oceanography	6		1						1			1				
Metallurgy																
Meteorology																
Mathematics				*												
Engineering																
All other engineering																*
Civil engineering .												*				
Chemical engineering																
Electrical engineering																
Mechanical engineering						*										
Life Sciences																
All other biology. .	34	*	2	2	3	1	35	*	4			5	3	3		1
Anatomy	5	85									1	2	1			5
General biology . .	16	*	34	5	2	1	1	5	9		*	12	3			*
Biochemistry	1	*	*	84		1			1			*		*		11
Botany	27	*	1	*	53	*	1	1	6			7	*	3		*
Biophysics	2		*	4		85	*	1	*			*				1
Genetics	1		*	2	1	*		77	1			*	2	12	*	
Microbiology	*		*	*					88	1	*					10
Pathology	2	1			1				4	62						30
Pharmacology		*		2					*		82	*				10
Physiology	1	*	1	8	*	2			1		*	82	*	1		2
Zoology	27	1	1	1		*	2	4	5			8	49			
Agriculture	5			1	*	*		3	1			3	*	80	*	1
Forestry	15	*	*	*	*		1	1	*	*		1	1	6	60	
Behavioral Sciences																
Psychology				*								*	*			
Anthropology								*								
Economics														7		*
Sociology																*
Humanities																
English													*			*
History																
Social Work																
Social work																*

*Less than one-half of 1 per cent.

TABLE D.9--Continued

Field of Study	Current Field of Study																N	NA	Total N
	Psychology	General and Other Social Sciences	Anthropology	Economics	Area, Regional Studies	Political Science Foreign Service	Sociology	General Arts, Fine and Applied	English and Journalism	Classics and Classical Lang.	History	Linguistics, Lang., Philology	Philosophy	Communications	Social Work	All Other Fields			
Physical Science																			
General physical sciences	1															44	159	1	160
All other earth and physical sciences																2	274	-	274
Astronomy						*										*	239	-	239
Chemistry																3	580	-	580
Physics									*				*			1	499	-	499
Geography	*	1			2	*					*		1			1	545	3	548
Geology and geophysics									*							*	490	3	493
Oceanography				1												1	169	-	169
Metallurgy											*					*	200	-	200
Meteorology								*									248	2	250
Mathematics	*												*			5	514	4	518
Engineering																			
All other engineering												*				3	622	3	625
Civil engineering		*			*											*	665	2	667
Chemical engineering																*	723	-	723
Electrical engineering																*	858	2	860
Mechanical engineering				*													852	-	852
Life Sciences																			
All other biology											*		*			6	430	2	432
Anatomy			*														237	1	238
General biology	*										*					12	804	3	807
Biochemistry																*	521	-	521
Botany																1	591	1	592
Biophysics											*						203	-	203
Genetics			1									*					281	2	283
Microbiology																*	663	1	664
Pathology																1	115	3	118
Pharmacology																	228	-	228
Physiology	1												*				464	-	464
Zoology			*													1	625	-	625
Agriculture		*		*		*										2	473	-	473
Forestry	*			2											*	4	473	-	473
Behavioral Sciences																			
Psychology	97		*				*	*			*					1	696	2	698
Anthropology	*		94	*			1	*		*	*	*				1	609	-	609
Economics	1	*	*	84		*	*		*		*				*	6	678	1	679
Sociology	2	1	2	*			93		*					*	*	1	557	2	559
Humanities																			
English		*						*	86		1	1				11	513	2	515
History		1			*	*	1	*			89	*	*			8	578	-	578
Social Work																			
Social work	1	1					*				*				97	*	797	2	799

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*Less than one-half of 1 per cent.

TABLE D.10
FIELD OF STUDY BY UNDERGRADUATE FIELD OF STUDY

(Per Cent)

Field of Study	Undergraduate Field of Study							N	NA	Total N
	Physical Science	Engineering	Life Sciences	Behavioral Sciences	Humanities	Social Work	All Other (Miscel-laneous)			
Physical Sciences										
General physical sciences	44	2	14	2	1	-	37	158	2	160
All other earth and physical sciences	50	44	1	*	*	-	4	272	-	274
Astronomy	85	13	*	*	1	-	1	239	-	239
Chemistry	91	4	2	-	*	-	3	580	-	580
Physics	83	15	*	-	1	-	1	498	1	499
Geography	57	2	2	17	8	-	14	545	3	548
Geology and geophysics	88	7	1	2	1	-	2	489	4	493
Oceanography	58	12	24	1	1	-	4	169	-	169
Metallurgy	24	75	-	-	-	-	2	199	1	200
Meteorology	72	17	4	1	1	-	5	249	1	250
Mathematics	74	12	1	2	3	-	8	514	4	518
Engineering										
All other engineering	13	84	*	-	*	-	2	621	4	625
Civil engineering	3	94	*	*	-	-	2	667	-	667
Chemical engineering	4	96	*	-	-	-	*	722	1	723
Electrical engineering	4	95	-	*	*	-	1	858	2	860
Mechanical engineering	2	97	-	*	-	-	*	851	1	852
Life Sciences										
All other biology	3	1	79	2	2	-	14	430	2	432
Anatomy	5	-	73	5	4	-	13	238	-	238
General biology	6	*	71	1	6	-	16	804	3	807
Biochemistry	59	2	31	2	2	-	5	517	4	521
Botany	6	*	84	*	2	-	7	590	2	592
Biophysics	65	9	23	-	2	-	1	203	-	203
Genetics	5	1	88	1	2	-	3	280	3	283
Microbiology	8	*	84	1	2	-	5	642	22	664
Pathology	16	-	44	2	4	-	33	111	7	118
Pharmacology	17	1	27	1	1	-	52	227	1	228
Physiology	17	3	64	2	4	-	9	461	3	464
Zoology	4	*	88	1	1	-	5	625	-	625
Agriculture	4	1	87	1	*	-	7	473	-	473
Forestry	6	1	88	1	1	-	3	473	-	473
Behavioral Sciences										
Psychology	4	2	2	74	11	-	7	695	3	698
Anthropology	7	1	2	62	22	*	6	608	1	609
Economics	6	3	13	49	6	-	24	676	3	679
Sociology	3	*	2	68	12	1	13	557	2	559
Humanities										
English	2	-	1	3	80	-	14	509	6	515
History	1	*	1	14	69	*	13	577	1	578
Social Work										
Social work	2	*	2	55	17	8	17	796	3	799

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*Less than one-half of 1 per cent.

TABLE D. 11

FIELD OF STUDY BY FIELD OF MASTER'S DEGREE

(Per Cent)

Field of Study	Field of Master's Degree																				
	General Physical Sciences	All Other Earth and Phy. Sci.	Astronomy	Chemistry	Physics	Geography	Geol., Geophys.	Oceanography	Metallurgy	Meteorology	Math., Statistics	General and Other Engineer.	Aeronautical Eng.	Civil Engineering	Chemical Eng.	Electrical Eng.	Eng. Sci., Phys., Mechanics	Industrial Eng.	Mechanical Eng.	Metallurgical Eng.	Mining Eng.
Physical Sciences																					
General physical sciences	11	3		3	3			3			3										
All other earth and physical sciences		14		17	14		12				3		2	2	11	11	5		2	2	5
Astronomy			60		22						9		4				1				
Chemistry		1		85			1								3						
Physics				1	86					1	1	1			1	6	1		1		
Geography		1				74	2							1							
Geology and geophysics		2		1	1		89	1		1	1			1							2
Oceanography . . .	1	1		3	7		18	31			4			1	1	1	1		1		
Metallurgy				2	6				40		2	2					2		2	43	
Meteorology . . .	1			1	5	1				81	2		1		1				1		
Mathematics . . .				1	2		1				75				2	4	1	1	1		1
Engineering																					
All other engineering		1		2	5				2		3	6	24	7	3	8	10	6	11	7	1
Civil engineering	1						1				1	1	1	85			9		1		
Chemical engineering				1								2			90	1				1	1
Electrical engineering					1						4	1				87	4		3		
Mechanical engineering					2							5	4	1	1	1	7		77		
Life Sciences																					
All other biology																					
Anatomy		1					1														
General biology .				1												1					
Biochemistry . . .	2			24	2			1							1						
Botany																1					
Biophysics	2			4	23						4				2	4					
Genetics						1					1										
Microbiology . . .				1										1							
Pathology																					
Pharmacology . . .	4			2																	
Physiology		1		1	1											2					
Zoology					1		1														
Agriculture . . .				2	1					1					1						
Forestry		1		4						1		3		1					1		
Behavioral Sciences																					
Psychology																					
Anthropology . . .		2			1	1	4									1					
Economics																		1			
Sociology																					
Humanities																					
English					1																
History																1					
Social Work																					
Social work . . .																					

TABLE D.11--Continued

Field of Study	Field of Master's Degree															
	All Other Biological Sciences	Anatomy, Histology	General Biology	Biochemistry	General Botany	Biophysics	Entomology	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Zoology	Agriculture	Forestry	All Other Health Fields
Physical Sciences																
General physical sciences	3		3										3			
All other earth and physical sciences																
Astronomy															1	
Chemistry					1									1		
Physics																
Geography															1	1
Geology and geophysics	1												1			
Oceanography . . .	8		5	1					3				5			
Metallurgy				2												
Meteorology . . .														1		1
Mathematics . . .	1													1		
Engineering																
All other engineering																
Civil engineering	1															
Chemical engineering																
Electrical engineering																
Mechanical engineering																
Life Sciences																
All other biology	21		3	1	4	1	34	1	6			3	7	7	1	1
Anatomy	3	41	4						5			4	21			10
General biology .	10		34	3	8		1	4	8			8	13		1	
Biochemistry . . .	6			51	1	2		1	2				1	5		2
Botany	16		13		43				3			4	3	7	2	
Biophysics	9		2	7	2	36			2			2				2
Genetics	2		8	1	6			34	2				10	31	1	
Microbiology . . .	4		6	3			1	1	74			1	4	2		3
Pathology	8	4	4	4	4			4	12	32						28
Pharmacology . . .				6					1		58	11				15
Physiology . . .	6	1	11	7		2			3	1	1	43	7	7		2
Zoology	12	1	16		1		2	3	3			2	51	3		
Agriculture . . .	4			1	1			2	2			4		82		1
Forestry	13				1		1		1			1	2	6	61	
Behavioral Sciences																
Psychology																
Anthropology . . .				1									1			6
Economics														6	2	1
Sociology																5
Humanities																
English																
History																
Social Work																
Social work . . .																1

TABLE D.11--Continued

Field of Study	Field of Master's Degree																N	Not Applicable	NA	Total N
	Psychology	General and Other Social Sciences	Anthropology	Economics	Area, Regional Studies	Political Science, Foreign Service	Sociology	General Arts, Fine and Applied	English and Journalism	Classics and Classical Lang.	History	Linguistics, Lang., Philology	Philosophy	Communications	Social Work	All Other Fields				
Physical Sciences																				
General physical sciences . . .																66	35	124	1	160
All other earth and phy. sci.																3	65	209	-	274
Astronomy . . .	1															1	85	154	-	239
Chemistry . . .									1							7	124	456	-	580
Physics													1			1	172	327	-	499
Geography . . .		2		1		2					2					8	205	343	-	548
Geology and geophysics . . .																1	163	329	1	493
Oceanography . .				1												3	73	96	-	169
Metallurgy . . .				2													65	135	-	200
Meteorology . .								1									80	170	-	250
Mathematics . .	1	1		1					1				2			7	163	353	2	518
Engineering																				
All other engineering . . .																2	202	422	1	625
Civil engineering		1														1	169	497	1	667
Chemical engineering . . .																	201	522	-	723
Electrical engineering . . .																1	223	636	1	860
Mechanical engineering . . .																	224	627	1	852
Life Sciences																				
All other biology				2												9	175	256	1	432
Anatomy	1		1								1					5	173	165	-	238
General biology	1										1					8	133	673	1	807
Biochemistry . .																2	123	396	2	521
Botany																8	266	324	2	592
Biophysics . . .																2	56	147	-	203
Genetics																4	143	139	1	283
Microbiology . .																2	192	471	1	664
Pathology . . .																	25	91	2	118
Pharmacology . .					1											1	84	143	1	228
Physiology . . .									1				2			3	188	276	-	464
Zoology																4	258	366	1	625
Agriculture . .				1												1	190	281	2	473
Forestry				3												3	152	320	1	473
Behavioral Science																				
Psychology . . .	88						1				1		1			5	242	454	2	698
Anthropology . .	1	1	63				1		1		2	2	2		4	8	178	431	-	609
Economics . . .	1	2		62		1			1		1		1			21	262	416	1	679
Sociology . . .	12	3	2			1	60		1		2				4	8	200	357	2	559
Humanities																				
English	1							1	84		1	2				10	144	371	-	515
History					2	1					80					13	229	348	1	578
Social Work																				
Social work . .	8	4		1		1	2				3				65	16	139	659	1	799

TABLE D.12

FIELD OF STUDY BY ANTICIPATED CAREER FIELD

(Per Cent)

Field of Study	Same		Other Composite Fields						All Other		N	NA	Total N
	Detailed Field	Composite Field	Physical Science	Engineering	Life Sciences	Behavioral Science	Humanities	Social Work	All Other (Miscellaneous)	All Other (Health)			
Physical Sciences													
General physical sciences	8	21	-	1	8	3	-	-	58	1	155	5	160
All other earth and physical sciences . .	19	30	-	41	2	-	-	-	7	1	270	4	274
Astronomy	89	7	-	2	1	-	-	-	2	-	236	3	239
Chemistry	87	2	-	1	4	-	-	-	5	1	571	9	580
Physics	86	3	-	6	1	-	-	-	3	-	497	2	499
Geography	74	2	-	-	-	10	2	-	11	-	536	12	548
Geology and geophysics	86	7	-	3	1	-	-	-	2	-	486	7	493
Oceanography	67	15	-	1	12	1	-	-	5	-	169	0	169
Metallurgy	43	7	-	47	*	-	*	-	3	-	199	1	200
Meteorology	80	9	-	2	-	-	-	-	9	-	246	4	250
Mathematics	76	3	-	6	-	-	1	-	13	-	512	6	518
Engineering													
All other engineering .	11	68	10	-	-	-	-	-	10	-	616	9	625
Civil engineering . . .	81	12	1	-	-	-	-	-	5	1	665	2	667
Chemical engineering .	86	8	4	-	-	-	-	-	2	-	719	4	723
Electrical engineering	87	8	3	-	-	-	-	-	2	-	844	16	860
Mechanical engineering	77	19	2	-	-	-	-	-	2	-	848	4	852
Life Sciences													
All other biology . . .	30	57	-	-	-	-	1	-	9	3	426	6	432
Anatomy	67	11	-	-	-	-	-	-	2	20	236	2	238
General biology	14	54	1	-	-	1	-	-	27	3	799	8	807
Biochemistry	72	5	4	-	-	-	-	-	2	16	519	2	521
Botany	39	52	2	-	-	-	-	-	5	-	585	7	592
Biophysics	76	14	4	-	-	-	1	-	1	3	202	1	203
Genetics	65	30	1	-	-	1	-	-	1	-	278	5	283
Microbiology	74	10	-	-	-	-	-	-	2	15	659	5	664
Pathology	50	10	-	-	-	-	-	-	1	39	115	3	118
Pharmacology	71	6	6	-	-	-	-	-	-	17	227	1	228
Physiology	65	20	1	-	-	2	-	-	1	11	461	3	464
Zoology	34	54	-	-	-	-	-	-	8	3	619	6	625
Agriculture	73	19	2	1	-	1	-	-	4	1	470	3	473
Forestry	56	28	6	1	-	1	-	-	7	-	468	5	473
Behavioral Sciences													
Psychology	93	1	*	*	*	-	1	*	3	*	693	5	698
Anthropology	86	6	3	-	-	-	1	-	3	1	602	7	609
Economics	65	4	-	-	7	-	1	-	22	-	669	10	679
Sociology	74	9	-	-	-	-	1	3	10	3	552	7	559
Humanities													
English	70	3	-	-	1	1	-	1	24	-	503	12	515
History	67	2	-	-	-	6	-	-	25	-	571	7	578
Social Work													
Social work	92	-	-	-	-	5	1	-	2	1	793	6	799

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*Less than one-half of 1 per cent.

TABLE D.13

FIELD OF STUDY BY EXPECTED FIRST EMPLOYER

(Per Cent)

Field of Study	Expected First Employer: Self-employed Family Business	Private Company	Professional Partnership	Research Organization, Institute	College, University	Junior College, Technical Inst.	Elementary, Secondary School, or School System	Hospital, Clinic, Church, Welfare Other Non-Profit	Federal Government (U.S.)	State or Local Government	Other	Do Not Expect Employment	N	NA	Total N
Physical Sciences															
General physical sciences . . .	-	4	1	3	18	7	66	-	-	1	1	-	149	11	160
All other earch and physical sciences	2	49	-	15	16	1	2	-	13	1	1	-	268	6	274
Astronomy . . .	-	9	-	26	51	-	1	-	12	-	-	-	233	6	239
Chemistry . . .	1	33	-	19	33	2	4	1	5	1	-	-	564	16	580
Physics	-	30	-	20	35	1	1	-	11	-	1	-	489	10	499
Geography . . .	-	3	-	5	52	7	12	1	14	5	-	-	541	7	548
Geology and geophysics . . .	1	35	-	16	29	1	2	1	12	2	2	-	485	8	493
Oceanography . .	1	8	-	33	33	-	1	-	23	1	1	-	166	3	169
Metallurgy . . .	2	57	-	23	11	*	-	*	7	-	-	-	197	3	200
Meteorology . .	-	6	-	20	15	-	1	-	57	-	2	-	246	4	250
Mathematics . .	-	24	-	10	43	2	12	1	6	1	-	1	508	10	518
Engineering															
All other engineering . . .	-	53	1	15	14	-	-	-	14	1	1	-	614	11	625
Civil engineering	1	42	3	6	21	-	-	-	16	10	1	-	652	15	667
Chemical engineering . . .	-	71	1	13	10	-	-	-	3	-	-	-	710	13	723
Electrical engineering . . .	1	65	-	14	12	-	-	-	7	-	1	-	836	24	860
Mechanical engineering . . .	1	58	-	13	18	1	-	-	8	-	1	-	839	13	852
Life Sciences															
All other biology	-	5	-	14	47	1	5	5	17	4	2	-	417	15	432
Anatomy.	2	-	1	12	71	1	1	6	5	-	1	-	230	8	238
General biology	1	4	1	14	35	6	32	4	4	-	1	-	742	65	807
Biochemistry . .	2	6	2	30	47	-	-	9	6	-	1	-	500	21	521
Botany	-	3	-	10	67	3	6	1	8	1	1	1	582	10	592
Biophysics . . .	-	4	-	25	60	-	1	1	8	-	-	-	201	2	203
Genetics	-	6	-	18	68	-	1	-	4	1	-	-	276	7	283
Microbiology . .	4	7	2	24	35	3	1	10	10	-	1	4	640	24	664
Pathology . . .	8	1	5	18	42	-	-	16	9	2	-	-	116	2	118
Pharmacology . .	1	16	-	22	50	-	-	2	7	-	1	-	222	6	228
Physiology . . .	-	7	2	23	54	-	1	5	7	-	1	-	459	5	464
Zoology	1	2	-	16	63	3	6	1	6	2	-	1	611	14	625
Agriculture . .	2	15	-	14	47	1	2	-	13	5	1	-	464	9	473
Forestry	2	16	-	16	21	-	1	-	32	12	1	-	462	11	473
Behavioral Science															
Psychology . . .	1	7	1	12	35	2	5	28	5	3	1	-	680	18	698
Anthropology . .	-	*	*	15	71	3	1	3	4	-	2	2	593	16	609
Economics . . .	2	16	1	5	49	2	3	1	17	2	2	-	670	9	679
Sociology . . .	1	3	-	9	63	2	3	6	4	6	2	-	545	14	559
Humanities															
English	2	3	-	-	55	6	28	2	1	-	1	1	492	23	515
History	-	2	-	2	58	4	25	2	4	1	1	1	557	21	578
Social Work															
Social work . .	-	1	-	1	4	-	2	62	4	25	1	-	775	24	799

*Less than one-half of 1 per cent.

TABLE D.14

FIELD OF STUDY BY EXPECTED LONG-RUN EMPLOYER

(Per Cent)

Field of Study	Expected Long-Run Employer												N	NA	Total N
	Self-employed, Family Business	Private Company	Professional Partnership	Research Organization, Institute	College, University	Junior College, Technical Inst.	Elementary, Secondary School, or School System	Hospital, Clinic, Church, Welfare Other Non-Profit	Federal Government (U.S.)	State or Local Government	Other	Do Not Expect Employment			
Physical Sciences															
General physical sciences . . .	1	3	-	5	38	8	39	1	1	1	1	1	152	8	160
All other earth and physical sciences . . .	5	36	3	15	28	1	1	1	10	-	-	-	266	8	274
Astronomy . . .	-	4	-	18	66	-	-	-	10	-	-	-	237	2	239
Chemistry . . .	3	29	1	16	43	-	4	1	3	-	-	1	570	10	580
Physics	1	21	1	18	51	-	1	-	7	-	1	-	489	10	499
Geography . . .	2	3	1	5	67	4	6	1	8	2	2	-	545	3	548
Geology and geophysics . . .	5	21	1	12	51	-	1	-	6	1	2	-	486	7	493
Oceanography . .	1	5	1	23	52	-	1	-	15	-	2	-	166	3	169
Metallurgy . . .	5	41	1	24	25	-	-	-	5	-	-	-	198	2	200
Meteorology . .	2	5	-	15	31	1	1	1	41	1	2	-	247	3	250
Mathematics . .	1	20	-	9	52	2	8	1	5	2	1	1	507	11	518
Engineering															
All other engineering . . .	6	40	5	13	26	-	-	-	10	-	1	-	615	10	625
Civil engineering	12	21	16	6	29	-	-	-	9	6	1	1	650	17	667
Chemical engineering . . .	4	53	4	11	26	-	-	-	2	-	-	-	713	10	723
Electrical engineering . . .	6	51	3	14	19	-	-	-	5	-	1	-	839	21	860
Mechanical engineering . . .	8	44	4	14	25	-	-	-	6	-	1	-	842	10	852
Life Sciences															
All other biology	2	5	1	12	54	2	3	4	14	2	1	1	419	13	432
Anatomy	4	-	3	12	78	-	-	2	2	-	-	1	232	6	238
General biology	5	2	-	12	50	4	23	1	2	-	-	1	780	27	807
Biochemistry . .	7	6	3	23	56	-	1	2	3	-	-	1	503	18	521
Botany	2	2	1	8	74	2	3	1	6	1	1	1	580	12	592
Biophysics . . .	2	4	-	14	72	-	-	1	6	-	1	-	200	3	203
Genetics	3	3	-	10	77	-	1	1	3	1	-	-	276	7	283
Microbiology . .	8	5	3	25	42	3	1	3	8	-	1	1	643	21	664
Pathology . . .	9	1	6	27	41	-	-	10	5	1	2	-	115	3	118
harmacology . .	4	13	-	19	59	-	-	1	3	-	1	-	223	5	228
hysiology . . .	2	4	2	19	65	-	-	4	4	-	1	-	456	8	464
oology	2	1	1	13	72	2	3	-	4	1	-	-	612	13	625
griculture . .	8	13	1	12	50	-	1	-	11	3	-	-	464	9	473
orestry	6	15	1	13	38	-	-	-	22	5	-	-	463	10	473
ehavioral Science															
sychology . . .	8	5	6	10	47	1	3	15	2	1	2	-	680	18	698
nthropology . .	-	-	-	15	76	1	-	2	4	-	2	2	591	18	609
conomics . . .	6	14	2	2	60	-	1	1	11	2	1	-	662	17	679
ociology . . .	1	3	1	9	67	1	1	6	4	3	2	1	545	14	559
Humanities															
nglish	3	1	1	-	73	3	14	2	1	-	-	2	498	17	515
istory	1	1	-	1	71	2	13	2	5	1	1	1	561	17	578
Social Work															
ocial work . .	2	2	4	2	11	-	2	52	7	15	2	1	774	25	799

TABLE D.15

FIELD OF STUDY BY ANTICIPATED CAREER ACTIVITIES

(Per Cent)

Field of Study	Anticipated Career Activities					N	NA	Total N
	Teaching	Research and Development	Administration or Management	Service to Patients or Clients	None of the Above			
Physical Sciences								
General physical sciences	92	27	16	5	1	155	5	160
All other earth and physical sciences	37	78	37	4	1	267	7	274
Astronomy	69	93	16	-	-	238	1	239
Chemistry	53	83	21	2	1	574	6	580
Physics	58	87	14	1	-	488	11	499
Geography	82	51	19	5	3	546	2	548
Geology and geophysics	62	82	18	5	2	488	5	493
Oceanography	56	89	19	2	-	167	2	169
Metallurgy	30	87	38	2	-	200	-	200
Meteorology	46	80	35	11	3	246	4	250
Mathematics	71	62	15	3	1	510	8	518
Engineering								
All other engineering	37	67	51	8	-	615	10	625
Civil engineering	39	48	47	24	4	660	7	667
Chemical engineering	32	85	39	6	1	717	6	723
Electrical engineering	30	85	36	2	1	852	8	860
Mechanical engineering	33	77	39	5	2	850	2	852
Life Sciences								
All other biology	64	79	15	7	1	429	3	432
Anatomy	87	85	16	20	-	233	5	238
General biology	81	56	9	7	1	798	9	807
Biochemistry	64	83	11	17	-	515	6	521
Botany	78	75	12	2	1	589	3	592
Biophysics	76	94	16	5	-	202	1	203
Genetics	75	88	16	4	-	279	4	283
Microbiology	58	75	12	18	2	662	2	664
Pathology	72	83	24	46	-	116	2	118
Pharmacology	70	87	20	13	-	225	3	228
Physiology	77	88	17	15	-	458	6	464
Zoology	80	76	12	4	-	621	4	625
Agriculture	55	74	30	9	2	471	2	473
Forestry	44	72	47	5	1	471	2	473
Behavioral Science								
Psychology	65	73	19	54	-	693	5	698
Anthropology	85	83	14	4	2	605	4	609
Economics	68	54	38	8	2	675	4	679
Sociology	77	68	25	16	1	555	4	559
Humanities								
English	92	23	9	4	4	512	3	515
History	91	41	17	5	2	567	11	578
Social Work								
Social work	27	27	42	84	1	790	9	799

TABLE E.1

FIELD OF STUDY BY EMPLOYMENT STATUS

(Per Cent)

Field of Study	Employment, 6-62 to 7-63				Currently Employed at Same Job			
	Yes	N	NA	Total	Yes	N	NA	Total
Physical Sciences								
General physical sciences	70	159	1	160	78	108	3	111
All other earth and physical sciences	62	273	1	274	74	169	1	170
Astronomy	65	239	-	239	46	155	1	156
Chemistry	47	580	-	580	63	269	4	273
Physics	60	499	-	499	60	296	2	298
Geography	68	548	-	548	66	369	6	375
Geology and geophysics .	59	493	-	493	51	288	4	292
Oceanography	53	169	-	169	49	88	1	89
Metallurgy	68	200	-	200	82	134	1	135
Meteorology	58	248	2	250	69	141	4	145
Mathematics	63	517	1	518	64	321	4	325
Engineering								
All other engineering . .	74	622	3	625	68	462	1	463
Civil engineering	79	666	1	667	65	521	4	525
Chemical engineering . .	68	723	-	723	82	490	4	494
Electrical engineering .	82	857	3	860	80	695	10	705
Mechanical engineering .	80	850	2	852	78	680	1	681
Life Sciences								
All other biology	36	432	-	432	59	153	1	154
Anatomy	36	238	-	238	52	85	-	85
General biology	49	807	-	807	64	388	4	392
Biochemistry	33	521	-	521	37	170	2	172
Botany	39	592	-	592	52	227	3	230
Biophysics	30	203	-	203	42	60	-	60
Genetics	36	283	-	283	51	101	1	102
Microbiology	39	664	-	664	58	257	3	260
Pathology	56	117	1	118	79	66	-	66
Pharmacology	36	228	-	228	59	82	-	82
Physiology	38	464	-	464	56	174	2	176
Zoology	44	623	2	625	53	275	1	276
Agriculture	45	473	-	473	65	212	2	214
Forestry	63	473	-	473	50	291	7	298
Behavioral Sciences								
Psychology	59	698	-	698	61	411	3	414
Anthropology	52	609	-	609	49	313	5	318
Economics	65	679	-	679	63	434	5	439
Sociology	67	559	-	559	61	369	3	372
Humanities								
English	60	513	2	515	71	303	3	306
History	63	576	2	578	66	364	2	366
Social Work								
Social work	65	799	-	799	43	511	5	516

TABLE E.2

FIELD OF STUDY BY NUMBER OF MONTHS WORKING THIRTY-FIVE HOURS PER WEEK OR MORE

(Per Cent)

Field of Study	Months Working Thirty-five Hours per Week or More													N	NA	Total N
	None	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten	Eleven	Twelve			
Physical Sciences																
General physical sciences	9	-	5	8	-	1	1	-	-	36	23	2	15	110	1	111
All other earth and physical sciences	10	1	5	16	1	-	1	1	-	4	-	2	60	169	1	170
Astronomy	15	1	10	44	4	1	1	-	1	1	1	-	24	156	-	156
Chemistry	14	3	7	23	1	2	*	1	*	2	4	*	41	269	4	273
Physics	17	2	7	30	2	1	1	-	*	1	1	1	37	296	2	298
Geography	20	3	10	19	3	2	1	1	1	10	6	3	22	363	12	375
Geology and geophysics	15	3	10	37	8	1	1	1	2	3	1	1	18	291	1	292
Oceanography	18	1	11	37	9	2	1	1	1	-	-	-	18	89	-	89
Metallurgy	7	-	3	13	2	-	1	1	1	3	-	-	69	134	1	135
Meteorology	20	3	6	24	2	1	-	1	1	3	1	1	37	139	6	145
Mathematics	21	2	7	20	2	*	1	1	2	6	4	2	32	321	4	325
Engineering																
All other engineering	7	1	4	24	3	1	2	-	*	2	*	1	55	457	6	463
Civil engineering	8	1	6	29	5	1	1	*	1	2	1	-	46	521	4	525
Chemical engineering	8	*	6	27	5	1	*	2	1	2	2	-	46	490	4	494
Electrical engineering	6	*	2	20	3	1	*	1	*	1	1	1	61	698	7	705
Mechanical engineering	7	1	4	18	4	*	1	1	*	2	1	1	58	677	4	681
Life Sciences																
All other biology	14	1	8	29	8	1	2	-	-	1	2	9	23	153	1	154
Anatomy	30	1	15	18	5	-	4	4	2	1	-	2	17	84	1	85
General biology	30	3	9	13	1	1	2	1	1	6	8	3	23	391	1	392
Biochemistry	15	2	23	37	6	2	2	*	-	*	-	-	13	171	1	172
Botany	30	5	7	20	10	4	1	-	-	5	5	2	13	227	3	230
Biophysics	22	3	15	33	2	-	3	2	-	3	-	2	15	60	-	60
Genetics	19	2	14	26	4	-	1	3	-	2	2	1	27	101	1	102
Microbiology	19	*	14	27	2	*	3	1	1	3	1	1	29	258	2	260
Pathology	23	2	-	11	2	-	3	-	2	-	-	-	58	65	1	66
Pharmacology	30	1	15	15	6	1	4	1	1	4	1	1	20	81	1	82
Physiology	28	1	8	25	4	2	-	-	1	1	2	-	29	172	4	176
Zoology	27	3	11	30	4	1	1	-	*	8	1	*	14	274	2	276
Agriculture	17	1	5	25	4	1	2	1	1	3	1	1	36	211	3	214
Forestry	10	1	6	33	12	1	3	1	3	2	1	2	24	293	5	298
Behavioral Sciences																
Psychology	31	1	10	24	3	1	3	1	-	2	2	2	21	412	2	414
Anthropology	27	3	13	24	5	2	5	1	1	2	2	2	14	314	4	318
Economics	17	3	7	25	3	1	3	2	1	5	3	2	30	433	6	439
Sociology	22	4	9	18	3	1	5	1	2	3	5	2	26	371	1	372
Humanities																
English	23	1	7	15	1	2	2	2	1	12	14	2	18	302	4	306
History	26	2	8	15	3	2	1	-	1	6	10	3	22	363	3	366
Social Work																
Social work	14	1	12	43	10	2	1	*	1	*	1	1	14	511	5	516

*Less than one-half of 1 per cent.

TABLE E.3

FIELD OF STUDY BY CURRENT FIELD OF EMPLOYMENT (COMPOSITE FIELDS)

(Per Cent)

Field of Study	Composite Field of Employment							N	NA	Total N
	Physical Sciences	Engineering	Life Sciences	Behavioral Sciences	Humanities	Social Work	All Other Miscellaneous and Health			
Physical Sciences										
General physical sciences	13	4	6	-	-	-	77	106	5	111
All other earth and physical sciences.	22	57	1	1	-	-	19	166	4	170
Astronomy	73	11	2	1	1	-	12	154	2	156
Chemistry	69	4	6	1	1	-	18	265	8	273
Physics	58	22	3	-	-	-	17	292	6	298
Geography	41	3	2	7	1	-	45	345	30	375
Geology and geophysics	66	8	1	1	1	-	22	283	9	292
Oceanography	62	7	10	-	-	-	20	88	1	89
Metallurgy	32	62	-	1	-	-	5	130	5	135
Meteorology	68	6	-	-	-	-	26	139	6	145
Mathematics	49	15	3	2	1	-	31	318	7	325
Engineering										
All other engineering	10	77	*	1	-	-	12	458	5	463
Civil engineering .	1	89	*	*	*	1	9	510	15	525
Chemical engineering	8	87	*	*	*	-	5	487	7	494
Electrical engineering	2	93	-	1	*	-	3	690	15	705
Mechanical engineering	1	93	*	*	-	*	5	674	7	681
Life Sciences										
All other biology .	2	-	60	1	-	-	36	151	3	154
Anatomy	1	-	49	-	2	-	48	84	1	85
General biology . .	3	1	48	2	-	1	46	377	15	392
Biochemistry	16	2	50	2	-	-	31	166	6	172
Botany	4	3	60	2	*	-	31	222	8	230
Biophysics	32	12	38	-	-	-	19	59	1	60
Genetics	3	-	68	4	1	-	24	99	3	102
Microbiology	4	*	60	1	-	-	35	255	5	260
Pathology	-	-	44	-	2	-	55	64	2	66
Pharmacology	7	1	32	-	-	-	59	81	1	82
Physiology	5	4	56	1	1	-	34	172	4	176
Zoology	3	1	63	2	*	-	31	274	2	276
Agriculture	2	3	74	1	1	-	19	207	7	214
Forestry	4	3	70	2	*	*	20	283	15	298
Behavioral Sciences										
Psychology	*	2	1	59	*	2	35	405	9	414
Anthropology	2	3	2	43	3	3	44	312	6	318
Economics	1	3	9	32	1	*	53	419	20	439
Sociology	2	-	1	37	2	8	51	360	12	372
Humanities										
English	1	1	2	2	22	1	71	295	11	306
History	1	2	2	5	19	4	68	355	11	366
Social Work										
Social work	*	*	1	4	1	76	17	506	10	516

*Less than one-half of 1 per cent.

TABLE E.4

FIELD OF STUDY BY CURRENT EMPLOYER

(Per Cent)

Field of Study	Current Employer														
	Self-Employed, In Business Owned by Family	Private Company	Professional Partnership	Research Organization or Institute	College or University at Which I Am Enrolled	Another College or University	Junior College or Technical Institute	Elementary or Secondary School or School System	Hospital or Clinic, Church, Welfare, or Other Non-Profit	Federal Government (U.S.) (Other Than Above)	State or Local Government (Other Than Above)	Other	N	NA	Total N
Physical Sciences															
General physical sciences	2	8	-	1	8	4	1	72	1	4	1	2	108	3	111
All other earth and physical sciences	1	62	1	8	10	1	-	3	-	15	1	-	168	2	170
Astronomy	1	19	1	28	26	8	-	-	1	21	1	3	155	1	156
Chemistry	2	47	*	13	15	7	*	5	4	7	7	2	267	6	273
Physics	2	42	1	16	16	6	1	3	*	18	*	2	296	2	298
Geography	3	17	1	3	24	15	1	13	2	15	7	4	367	8	375
Geology and geophysics . .	5	38	2	15	17	6	-	2	1	12	9	3	290	2	292
Oceanography	5	14	1	16	37	5	2	2	-	24	6	-	88	1	89
Metallurgy	2	59	2	19	13	3	2	-	-	14	-	2	133	2	135
Meteorology	1	6	-	18	16	3	1	2	-	57	1	3	142	3	145
Mathematics	2	38	*	14	17	8	*	12	2	11	1	4	321	4	325
Engineering															
All other engineering . . .	1	60	*	13	12	2	*	-	1	13	1	2	462	1	463
Civil engineering	2	33	7	6	20	4	*	-	-	14	17	10	521	4	525
Chemical engineering . . .	1	66	-	13	14	2	2	1	*	6	1	1	490	4	494
Electrical engineering . .	1	67	*	13	12	2	1	-	*	7	*	1	694	11	705
Mechanical engineering . .	1	66	1	9	15	3	*	-	*	9	*	2	675	6	681
Life Sciences															
All other biology	2	14	-	10	34	5	-	4	12	16	8	1	154	-	154
Anatomy	7	6	-	8	35	9	-	1	24	6	2	5	85	-	85
General biology	1	16	1	16	17	5	1	30	13	3	4	3	386	6	392
Biochemistry	2	29	-	15	25	12	-	-	11	7	4	5	170	2	172

*Less than one-half of 1 per cent.

TABLE E.4--Continued

Field of Study	Current Employer												N	NA	Total N
	Self-Employed, In Business Owned by Family	Private Company	Professional Partnership	Research Organization or Institute	College or University at Which I Am Enrolled	Another College or University	Junior College or Technical Institute	Elementary or Secondary School or School System	Hospital or Clinic, Church, Welfare, or Other Non-Profit	Federal Government (U.S.) (Other Than Above)	State or Local Government (Other Than Above)	Other			
Life Sciences--Continued															
Botany	4	12	1	9	44	12	3	7	5	9	4	2	226	4	230
Biophysics	3	17	-	17	29	17	-	2	8	20	-	3	59	1	60
Genetics	1	17	1	12	48	12	1	2	5	8	4	1	101	1	102
Microbiology	1	12	1	15	29	7	*	3	27	11	5	2	256	4	260
Pathology	5	6	3	17	35	5	-	-	21	15	2	5	66	-	66
Pharmacology	2	48	-	6	25	5	-	1	11	5	2	4	81	1	82
Physiology	4	18	1	18	31	10	1	4	11	10	2	5	175	1	176
Zoology	3	10	1	15	40	12	2	7	6	6	9	4	275	1	276
Agriculture	9	10	*	5	44	8	-	4	1	18	8	3	212	2	214
Forestry	4	15	-	21	26	5	-	1	2	28	10	2	291	7	298
Behavioral Sciences															
Psychology	4	16	2	8	18	7	*	6	25	9	7	8	411	3	414
Anthropology	3	14	*	17	36	12	1	1	10	7	5	6	315	3	318
Economics	5	28	1	6	22	13	1	3	2	15	7	5	433	6	439
Sociology	4	13	2	10	26	8	2	5	17	5	10	8	367	5	372
Humanities															
English	5	19	1	2	17	8	2	32	6	6	2	6	301	5	306
History	4	17	2	3	18	9	1	27	9	5	6	6	361	5	366
Social Work															
Social work	1	6	1	2	4	2	-	1	55	3	29	4	510	6	516

*Less than one-half of 1 per cent.

TABLE E.5

FIELD OF STUDY BY JOB DUTIES

(Per Cent)

Field of Study	Job Duties: Teaching	Job Duties: Research and Development	Job Duties: Administration and Management	Job Duties: Service to Patients or Clients	Job Duties: Other	N	NA	Total N
Physical Sciences								
General physical sciences	80	4	5	3	14	109	2	111
All other earth and physical sciences	8	66	17	9	14	168	2	170
Astronomy	12	81	5	1	10	155	1	156
Chemistry	23	59	6	7	16	266	7	273
Physics	16	66	7	5	14	295	3	298
Geography	42	18	17	14	25	365	10	375
Geology and geophysics .	15	49	6	16	23	290	2	292
Oceanography	22	61	7	8	13	87	2	89
Metallurgy	7	78	13	4	9	133	2	135
Meteorology	11	45	13	16	26	141	4	145
Mathematics	31	43	7	8	19	320	5	325
Engineering								
All other engineering . .	8	59	23	6	15	460	3	463
Civil engineering	17	31	20	21	27	512	13	525
Chemical engineering . .	11	71	8	4	13	490	4	494
Electrical engineering .	11	79	10	3	7	694	11	705
Mechanical engineering .	13	67	11	4	17	675	6	681
Life Sciences								
All other biology	19	47	16	19	21	154	-	154
Anatomy	38	38	7	27	19	85	-	85
General biology	42	31	6	17	13	389	3	392
Biochemistry	12	54	3	21	18	169	3	172
Botany	45	34	10	8	13	226	4	230
Biophysics	19	71	9	7	16	58	2	60
Genetics	21	56	13	15	13	101	1	102
Microbiology	18	46	9	29	18	254	6	260
Pathology	35	58	8	47	11	66	-	66
Pharmacology	20	35	11	49	3	79	3	82
Physiology	32	48	9	17	19	175	1	176
Zoology	38	42	6	8	17	274	2	276
Agriculture	24	44	18	13	27	211	3	214
Forestry	18	55	20	8	16	291	7	298
Behavioral Sciences								
Psychology	15	35	9	35	21	410	4	414
Anthropology	22	33	15	14	30	313	5	318
Economics	37	32	33	19	24	329	10	439
Sociology	25	29	20	25	22	369	3	372
Humanities								
English	50	5	13	13	27	303	3	306
History	47	6	11	16	29	359	7	366
Social Work								
Social work	7	5	15	76	11	509	7	516

APPENDIX 4

SURVEY MATERIALS

national opinion research center NORC

UNIVERSITY OF CHICAGO
5720 Woodlawn Avenue, Chicago 37, Illinois
PLaza 2-6444 Area Code 312
PETER H. ROSSI, *Director*

Spring, 1963

Dear Graduate Student:

The National Science Foundation has asked the National Opinion Research Center of the University of Chicago to conduct a national survey of the graduate students in the sciences, engineering and several of the humanities.

The survey concerns the academic progress and financial circumstances of graduate students. Systematic information is needed on these matters to help shape policies in relation to graduate education.

You are one of 25,000 graduate students enrolled at 130 American universities who has been chosen by scientific selection procedures to participate in this survey. You are asked to contribute approximately forty-five minutes of your time toward the study by answering a questionnaire. The sampling method is designed to give a cross-section of American graduate students in the sciences, engineering and a few other fields. Your answers will remain completely confidential as they will be read only by the research staff. Reports of the study will be based on statistical tables identifying no individual.

Even though some of you are part-time students who do not think of yourselves as "graduate students", please answer every question where appropriate. We hope that all of you will answer as best you can. Although you are only one of 25,000 graduate students in the sample, it is essential that you participate. We urge you to complete the questionnaire so that our findings are representative of all American graduate students in the fields selected for study.

Thank you very much foı your help.

Sincerely,

Seymour Warkov

Seymour Warkov
Senior Study Director

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Chauncy D. Harris • Harry Kalven, Jr. • Frederick Mosteller • Alfred C. Nelson • George P. Shultz • Ralph W. Tyler • John T. Wilson • O. Meredith Wilson

FIELD LIST

The following field list is to be used in answering some or all of the following questions: 19 - 25, 42 D and I, and 43 D. Each field can be used to describe a field of study or a type of job. Thus, for example, in questions about fields of study, "Mechanical Engineering" means college courses in Mechanical Engineering; in questions about careers, "Mechanical Engineering" means the occupation of mechanical engineers.

When you have chosen from the list, the field or occupation which is your answer to a given question, please write its code number in the boxes. For example, "Mechanical Engineering" is (16).

1	6

AGRICULTURE

45	Agriculture, general
45	Agronomy, Field Crops
45	Animal husbandry
45	Dairy Manufacturing, Dairy Tech.
45	Farm Management
45	Food Technology
45	Horticulture
45	Ornamental Horticulture
45	Poultry Husbandry
45	Soils (Soil Sci., Mgt., & Conservation)
45	Agriculture, all other

86	ARCHITECTURE

BIOLOGICAL SCIENCES

31	Biology, general
33	Botany, general
41	Zoology, general
30	Anatomy and Histology
37	Bacteriology, Virology, Mycology, Parasitology, Microbiology
32	Biochemistry
34	Biophysics
3X	Cytology
3X	Ecology
3X	Embryology
35	Entomology
36	Genetics
3X	Nutrition
38	Pathology
39	Pharmacology
40	Physiology
3X	Plant Pathology
3X	Biological Sciences, all other

BUSINESS, COMMERCE AND ADMINISTRATION

92	Accounting
90	Advertising, Public Relations
9X	Military Service, Military Science
97	Secretarial Science (or employed as a secretary)
72	Industrial or Personnel Psychology
91	All other business and commercial fields (Business Administration, Marketing, Insurance, Finance, Industrial Relations,etc.)
93	Public Administration (or employed as government administrator if not covered by other fields)

Education (NOTE: Junior College, College and University Teaching should be coded by Field of Specialization, not as Education)

50	Elementary (including Kindergarten and Nursery School)
	Secondary--Academic Subject Fields
51	English
52	Modern Foreign Languages
53	Latin, Greek
54	History, Social Studies
55	Natural Science (General, Physics, Chemistry, Biology, etc.)
56	Mathematics
	Specialized Teaching Fields
57	Physical Education , Health, Recreation
58	Music Education
59	Art Education
60	Education of Exceptional Children (Including Speech Correction)
61	Agricultural Education
62	Home Economics Education
63	Business Education
64	Trade and Industrial Education (Vocational)
65	Industrial Arts Education (Non-Vocational)
66	Counseling and Guidance
67	Educational Psychology
68	Administration and Supervision
6X	Education, General and other specialties

Engineering

10	Aeronautical
11	Civil (including Agricultural, Architectural, Civil, Sanitary)
12	Chemical (including Ceramic)
13	Electrical
14	Engineering Science, Engineering Physics, Engineering Mechanics
15	Industrial
16	Mechanical (including Naval Architecture and Marine, Welding, Textile)
17	Metallurgical
18	Mining (including Mining, Geological, Geophysical, Petroleum)
1X	Engineering, General and other specialties

SAMPLE FINANCIAL INVENTORY

This enclosure contains a Financial Inventory which was filled out by a graduate student, John Barclay (pseudonym). It illustrates how the Inventory on pages 12 and 13 of the questionnaire is to be completed.

Barclay is a second year graduate student at a private university working for a doctor's degree in chemistry. He is married, the father of one pre-school child. His financial circumstances during the twelve month period of July, 1962 through June, 1963 are as follows:

INCOMING: He received a summer (1962) research assistantship paying $750 and a second stipend—also a research assistantship—worth $2,500 for the 1962-1963 academic year ($1,300 for tuition and $1,200 for living expenses). Gifts from parents and relatives totaling $500 were received by Barclay and his wife during the twelve month period. In addition, his wife's job paid $3,600 before taxes. Interest from a savings account and dividends from stock yielded fifty dollars. The final source of income was the sale of stock; it entailed a reduction in assets but it added another $500 to income. Thus Barclay's total income for the twelve month period was $7,900.

OUTGOING: Barclay's academic expenses amounted to $1,525. Of this sum $1,300 was paid out for tuition and fees (this was covered by the second stipend); texts, reference books and journals—$150; and instruments, equipment, supplies—$75. His estimated living expenses including rent, clothing and food, came to $3,400. Barclay bought a new car in April, 1962—before the time period under consideration. Cost of maintaining and operating the car plus depreciation totaled $500. This does not include the twelve monthly payments which will have been made through June, 1963 during the twelve month period. Each payment was $70 resulting in a reduction in liabilities of $840 by the end of June, 1963 (He did not know how much of the payment was for interest and put the entire sum under "reduction in liabilities." This is O.K.) Another $410 was paid for health and medical care for the family. Other expenses including taxes, entertainment, etc., came to $1,225. Barclay's total expenses for the twelve month period were $7,900, a sum which equals his income.

(Over)

ESTIMATED FINANCES FOR THE YEAR BEGINNING
JULY 1, 1962 AND ENDING JUNE 30, 1963

INCOMING

ANNUAL AMOUNTS IN DOLLARS

MAKE LARGE, CLEAR NUMBERS

ESTIMATE FOR THE TIME REMAINING TILL JUNE 30, 1963

APPROXIMATIONS ARE O.K.!

I. YOUR STIPEND INCOME

TRANSFER THESE AMOUNTS, IF ANY, FROM QUESTION 29D

1st stipend	$ 750
2nd stipend	$ 2500
3rd stipend	$ —
TOTAL →	$ 3250

II. OTHER INCOME

*Part time and full time work (before taxes)	$ —
Parents and relatives (gifts)	$ 500
Spouse's university job (before taxes)	$ —
Spouse's non-university job (before taxes)	$ 3600
Spouse's stipends	$ —
Veterans and GI benefits	$ —
Income from military service	$ —
†Other—excluding IV and V below	$ 50
TOTAL →	$ 4150

III. TOTAL OF I AND II → $ 7400

IV. REDUCTION IN ASSETS (Amounts): $ 500

withdraw savings; sell stock, car, house, property, etc.

V. ADDITION TO LIABILITIES (Amounts):

National Defense Education Act loan	$ —
Other educational loans (e.g., deferred tuition)	$ —
Other: installment debt, mortgages obtained since July, 1962	$ —
TOTAL →	$ —

VI. TOTAL OF III, IV, AND V → $ 7900

NOTE: Total IN (VI) and Total OUT (XII) should be equal. If not, please revise the amounts you have entered.

---

*If you have a faculty appointment as instructor, assistant professor, etc., include this salary.

†Other income includes interest from savings accounts; dividends from stocks and bonds; income from property; royalties; honoria; consultation and other professional activity. etc.

Deck 4

ESTIMATED FINANCES FOR THE YEAR BEGINNING JULY 1, 1962 AND ENDING JUNE 30, 1963

OUTGOING

ANNUAL AMOUNTS IN DOLLARS

MAKE LARGE, CLEAR NUMBERS

ESTIMATE FOR THE TIME REMAINING TILL JUNE 30, 1963

APPROXIMATIONS ARE O.K.!

VII. ACADEMIC EXPENSES (SELF)

A. TUITION AND FEES

Covered by stipend	$ 1300
Covered by cost of education allowances	$ —
Not covered by above	$ —

TOTAL → $ 1300

B. OTHER ACADEMIC EXPENSES

INCLUDE AMOUNTS COVERED BY STIPEND

Texts, reference books, journals	$ 150
Instruments, equipment, supplies	$ 75
Thesis expenses	$ —
Other, including tutorial costs	$ —

TOTAL → $ 225

VIII. TOTAL OF VII A AND VII B → $ 1525

IX. OTHER EXPENSES (SELF AND DEPENDENTS)

INCLUDE AMOUNTS COVERED BY STIPEND

*Living expenses	$ 3400
†Transportation	$ 500
‡Health and medical care	$ 410
§Other, excluding X and XI below	$ 1225

TOTAL → $ 5535

X. ADDITION TO ASSETS (Amounts):

Amount added to savings: buy stock, total value of house or car purchased since July, 1962, etc. $ —

XI. REDUCTION IN LIABILITIES (Amounts):

Amount repaid on loan; principal payments on car or house purchased prior to July, 1962; payments for deferred tuition; time payments, etc. $ 840

XII. TOTAL OF VIII, IX, X, AND XI → $ 7900

NOTE: Total IN (VI) and Total OUT (XII) should be equal. If not, please revise the amounts you have entered.

---

*Housing; food, beverages; personal maintenance; utility bills, etc.

†Local public transportation; operate and maintain own car; travel etc.

‡Self and family: health insurance premiums; medical and dental bills; drugs, etc. Exclude expenses covered by health insurance.

§Entertainment, gifts, contributions; insurance, taxes; purchase of house furnishings and consumer durables; spouse's academic expenses, etc.

SAMPLE FINANCIAL INVENTORY

81 ENGLISH AND JOURNALISM
  English & Literature
  Journalism

80 FINE & APPLIED ARTS
  Art, general
  Music
  Speech & Dramatic Art
  Fine & Applied Art, all other

FOREIGN LANGUAGE & LITERATURE
84 Linguistics
82 Latin and/or Classical Greek
84 French
84 Italian
84 Portugese
84 Spanish
84 Philogy & Lit. of Romance Lang.
84 German
84 Other Germanic Languages
84 Philology & Lit. of Germanic Languages
84 Arabic
84 Chinese
84 Hebrew
84 Hindi and Urdu
84 Japanese
84 Russian
84 Other Slavic languages
84 Foreign Languages, all other

46 FORESTRY

04 GEOGRAPHY

HEALTH PROFESSIONS
2X Hospital Administration
22 Nursing and/or Public Health Nursing
26 Occupational Therapy
23 Optometry
24 Pharmacy
25 Physical Therapy, Physiotherapy
2X Public Health
2X Radiologic Technology
20 Clinical Dental Science (beyond D.D.S. or D.M.D.)
21 Clinical Medical Sciences (beyond M.D.)
27 Clinical Veterinary Medical Sci. (beyond D.V.M.)
2X Health Professions, all other

98 HOME ECONOMICS
  Home Economics, general
  Child Development, Family Relations
  Clothing and Textiles
  Foods and Nutrition
  Institution Mgt., Institution Adm.
  Home Economics, all other

95 LAW

88 LIBRARY SCIENCE

MATHEMATICAL SUBJECTS
09 Mathematics
09 Statistics

PHILOSOPHY
85 Philosophy
85 Scholastic Philosophy

PHYSICAL SCIENCES
0X Physical Sciences, general
01 Astronomy
02 Chemistry
07 Metallurgy
08 Meteorology
0X Pharmaceutical Chemistry
03 Physics

Earth Sciences
05 Geology
05 Geophysics
06 Oceanography
00 Earth Sciences, all other

Physical Sciences
00 Physical Sciences, all other

PSYCHOLOGY
70 Clinical Psychology
66 Counseling & Guidance
71 Social Psychology
67 Educational Psychology
72 Industrial & Personal Psychology
73 General & Experimental Psychology
74 Other Psychological Fields

SOCIAL SCIENCES

Basic Social Sciences
7X Social Sciences, general
7X American Civilization, American Culture
75 Anthropology
77 Area Studies, Regional Studies
76 Economics
83 History
78 International Relations
78 Political Science or Government
79 Sociology
7X Basic Social Sciences, all other

Applied Social Sciences
76 Agricultural Economics
78 Foreign Service Programs
72 Industrial Relations
93 Public Administration
96 Social Work, Social Administration
7X Applied Social Sciences, all other

BROAD GENERAL CURRICULUMS & MISCELLANEOUS FIELDS
80 Arts, general program

Other Fields and Occupations
94 Foreign Service (Code as occupation only, not field of study)
98 Home Economics (Code either as a field of study or as an occupation if you mean working as a home economist for pay)
99 Housewife (Code as occupation only, not as field of study)
87 Radio-Television, Communications
89 Theology, Religion (Employment as a Clergyman or religious worker)

X0 Field of Study or Job Which has no Near Equivalent in This List (If you use this code, please describe your field in a word or two under the questions where it applies)

X1 Do not expect to be either employed full time or to be a Housewife. (Code only for questions about careers, not for field of study)

STIPEND INFORMATION

Questions 29, 34, 35, 40B and 52F refer to source and types of *stipends*. This includes any scholarship, fellowship, assistantship, or other stipend.

EXCLUDE....	loans and gifts from parents, relatives or any other source; exclude work performed as an instructor or assistant professor
INCLUDE....	waiver or reduction in tuition and fees even if you do not receive the money directly include waiver or reduction of tuition and fees under cost of education allowances received by the university
INCLUDE....	income from teaching or research in your field of study if paid as a graduate assistant by the school where you are enrolled or an affiliated organization include payment in kind, e.g., room and board
IF....	the funds are administered by the school you are attending but come from another source, e.g., a Federal agency such as the National Institutes of Health or the National Science Foundation, be sure to enter the code number for the Federal agency providing the funds (do not enter the code number for the school you are attending).
FOR EXAMPLE....	If the stipend is a research assistantship from your school, write the code number (52) in the boxes provided, such as:

5	2

Source of Stipend			Type of Stipend			
			Duty Free Stipend		Stipend Requiring Duties	
			Equal to or less than my tuition bill	For tuition plus cash grant	Research Assistantship	Teaching Assistantship
U.S. Federal Government (directly or through your school)	Atomic Energy Commission		00	20	40	60
	Department of Defense		01	21	41	61
	National Science Foundation		02	22	42	62
	Veterans Administration (Exclude GI Bill)		03	23	43	63
	National Aeronautics and Space Administration		04	24	44	64
	Office of Education	National Defense Education Act	05	25	45	65
		Other Office of Education	06	26	46	66
	Public Health Service	National Institutes of Health Fellowship Program	07	27	47	67
		N.I.H. Training Grant and Traineeship Program	08	28	48	68
	Other PHS		09	29	49	69
	Other Federal Government		0X	2X	4X	6X
Private Foundation, Philanthropic Organization, etc.			10	30	50	70
Industrial or Business Corporation or Firm			11	31	51	71
Directly from the school that I am now attending			12	32	52	72
The school I am attending, but I do not know the primary source			13	33	53	73
State or local government (U.S.)			14	34	54	74
Foreign government and other foreign sources			15	35	55	75
Other			16	36	56	76

Conducted by:
National Opinion Research Center
University of Chicago
5720 S. Woodlawn Avenue
Chicago 37, Illinois

Survey 468
Spring, 1963

NATIONAL SCIENCE FOUNDATION

STUDY OF GRADUATE STUDENT FINANCES

INSTRUCTIONS

Please Read Before You Begin

1. Answer every question unless you are specifically instructed that a given question does not apply to you.

2. When answering questions with a limited number of alternatives, please choose the statement which comes closest to describing your circumstances or personal history, even if it does not fit your situation precisely.

3. Select your answer to the questions by CIRCLING the number or letter next to the alternative of your choice. For example:

   I am now . . . (Circle one)

   A student in high school. . . . . X 73/R

   A student in college 1

   A student in graduate or professional school. [✓ 2]

4. The numbers and letters are necessary for processing the data and have been arbitrarily chosen. The numbers in the far right margin (73/R) should be ignored.

THANK YOU VERY MUCH FOR YOUR HELP

Budget Bureau Number 99-6306
Approval Expires October 30, 1963

YOUR STUDIES

In this section we are interested in finding out about your past, present and future studies.

1. Please indicate the highest degree you now hold, the next degree you expect to receive, and the highest degree you expect to hold eventually:

	None	Bachelor's (Undergraduate) e.g. BA, BS, BE, B Chem Eng.	First Professional, e.g. LLB, MD, etc.	Master's, e.g. MA, MS, MSW, M Civ. Eng.	Doctorate e.g. PhD, EdD, JSD, etc.	
A. Highest degree you now hold *(Circle one)*	5	6	7	8	9	11/4
B. Next degree you expect to receive *(Circle one)*	5	6	7	8	9	12/4
C. Highest degree you expect to hold *(Circle one)*	5	6	7	8	9	13/4

2. What is your best guess as to when you will receive: (If you are not working for a degree, skip to Question 3)

A. The degree for which you are now working? 14-15/XX

Month__________ Year 19_____ 16-17/XX

B. The highest degree you expect to hold? 18-19/XX

Month__________ Year 19_____ 20-21/XX

3. What system does your school use? *(Circle one)*

Quarter system 7 22/6
Trimester system 8
Semester system 9

4. Please indicate which category best describes your enrollment status for each of the following academic terms. *(Circle one in each of columns A, B, C, and D)*

		A *(Circle one)*	B *(Circle one)*	C *(Circle one)*	D *(Circle one)*
	IF QUARTER OR TRIMESTER SYSTEM: →	Summer '62	Fall '62	Winter '63	Spring '63
	IF SEMESTER SYSTEM: →	Summer '62	Fall '62	Spring '63	Circle 8 Below
ENROLLED	In a program in which "full-time study" is possible and carrying:				
	full course load or greater	0	0	0	0
	less than a full course load	1	1	1	1
	no courses, enrolled only for completion of thesis, independent research, etc.	2	2	2	2
	in night school or other program in which full-time study is impossible:	3	3	3	3
	For correspondence courses	4	4	4	4
	OR				
NOT ENROLLED BECAUSE	Interrupting my studies temporarily	5	5	5	5
	No intention of going on further	6	6	6	6
	Completing thesis, doing independent research, etc.	7	7	7	7
	On vacation	8			
	My school is on semester system				8
	Other *(Circle and specify)*	9	9	9	9
		23/X	24/X	25/X	26/X

5. **Which of the following degree requirements are you working on this term?** ***(Circle any that apply)***

Taking courses or seminars .... **X** 27/Y
Preparing for comprehensive or "qualifying" examinations **0**
Language examination **1**
Research for and preparation of my thesis **2**
Other ***(Circle and specify)*** ____________ **3**
None **4**

---

6. **What is considered a full course load at your school and how many courses are you taking this term? If load is measured in hours, translate as best you can.**
(Circle one in each column)

	Full Course Load Is: *(Circle one)*	Number of Courses I Am Taking: *(Circle one)*
Five courses or more	5	5
Four courses	4	4
Three courses	3	3
Two courses	2	2
One course	1	1
None	▨	0
	28/6	29/6

---

7. **On the average, how many hours a week were you engaged in academic study this term? Include courses, thesis work, practicum, study time, etc. required for the degree.** ***(Circle one)***

None	Less than 10	10-19	20-29	30-39	40-49	50-59	60-69	More than 69
0	1	2	3	4	5	6	7	8

30/9

---

8. **Which of the following best describes your primary reason for enrolling in your current study program?** ***(Circle one)***

Definitely intend to apply enrollment to a graduate degree .... **X** 31/Y
Primary reason not necessarily to get a graduate degree but:
...to pass certification or other requirements for teaching or counseling in primary or secondary school system **0**
...to gain specific "job knowledge" for my present or future employer **1**
...to enhance my own knowledge regardless of degree, career, or job benefits **2**
...other ***(Circle and specify)*** ____________ **3**

---

9. **How many calendar years elapsed between the time you received your bachelors degree and the start of your graduate studies?** ***(Circle one)***

Less than 1 year	1 year	2 years	3 years	4 years	5-9 years	10 or more years
0	1	2	3	4	5	6

32/7

---

10. **During which of the previous academic years were you enrolled for graduate study?**
Circle as many as apply in the first column and one in each of the other columns)

	Prior to June '58	July '58—June '59	July '59—June '60	July '60—June '61	July '61—June '62
Enrolled full time for two or more terms of graduate study	5	X	5	X	5
Enrolled full time for only one term of graduate study	6	0	6	0	6
Not enrolled full time any terms but enrolled part time at least one term of graduate study	7	1	7	1	7
Not enrolled in graduate school during the year	8	2	8	2	8
Had not yet begun my graduate studies	9	3	9	3	9
	33/4	34/Y	35/4	36/Y	37/4

11. **Which of the following best describes your progress in academic study? *(Circle one)***

I have completed less than one full year of required work for an advanced degree	X	38/y
I have completed one or more years of work but I do not expect to receive a doctor's degree by June, 1963	0	
I expect to complete all doctoral requirements by June, 1963	1	

---

12. **What proportion of course work on your degree will you have completed by June, 1963? *(Circle one)***

All of it	6	39/5
About three-quarters of my course work	7	
Half of my course work but less than three-quarters	8	
Less than half of my course work	9	

---

13. **What are your eventual plans concerning the doctoral degree? *(Circle one)***

I definitely plan to get a doctorate	1	40/0
I might eventually get a doctorate, but my plans aren't definite	2	
I do not plan to get a doctorate	3	
It is too early in my graduate work to have an opinion	4	

---

14. **Given your current aptitudes and interests, how much difference do you think getting a Ph.D. would make in your ability to attain the following? *(Circle one in each row)***

		A Ph.D. will help . . .			
		a great deal	a moderate amount	hardly any	
A. Holding a job whch I enjoy a great deal	*(Circle one)*	7	8	9	41/6
B. Making a contribution to knowledge	*(Circle one)*	X	0	1	42/Y
C. Doing my job very well	*(Circle one)*	3	4	5	43/2
D. Making a good living	*(Circle one)*	7	8	9	44/6
E. Feeling that I know more than almost anybody else about some subject	*(Circle one)*	X	0	1	45/y
F. Attaining a position of authority	*(Circle one)*	3	4	5	46/2
G. Making a contribution to humanity	*(Circle one)*	7	8	9	47/6

---

15. **What is the letter grade that best represents your grade point average so far in your graduate studies? *(Circle one)***

IF LETTER GRADES ARE NOT GIVEN, translate into letter grades as best you can.

(Circle one)	A	A–	B+	B	B–	C+	C	C–	Less than C–	No grades received yet	
	0	1	2	3	4	5	6	7	8	9	48/X

---

16. **IF YOU HAVE A MASTER'S DEGREE, ANSWER A, B, AND C BELOW: IF YOU DO NOT HAVE A MASTER'S DEGREE, SKIP TO QUESTION 17.**

A. When did you receive it? 49-50/RR

Month ____________ Year 19______ 51-52/RR

B. Where did you receive this degree? *(Circle one)*

The school I'm now attending	1	53/R
A different school	2	

C. IF DIFFFRENT: Please write its name and location below.

School	City	State (Country if non-U.S.

17. IF YOU HAVE A BACHELOR'S DEGREE, ANSWER A, B, C, AND D BELOW: IF YOU DO NOT HAVE A BACHELOR'S DEGREE, SKIP TO QUESTION 18.

A. When was your (last) bachelor's degree obtained? 54-55/RR

Month ____________________ Year 19_____ 56-57/RR

B. Where did you receive this degree? *(Circle one)*

The school I am now attending 1 58/R
A different school 2

C. IF A DIFFERENT SCHOOL, please write its name and location below.

School	City	State (Country if non-U.S.)

D. What was your over-all (cumulative) grade point average for work leading to this bachelor's degree?

IF LETTER GRADES WERE NOT GIVEN, translate into letter grades as best you can.

	A	A−	B+	B	B−	C+	C	C−	D+	D or less	
(Circle one)	0	1	2	3	4	5	6	7	8	9	59/R

18. Are you .... *(Circle any which apply)* 60/2

an alien studying in this country on a non-immigrant visa 1
a member of a religious order which maintains you 2
in the military service (full-time career) 3
an unclassified and "special" student, i.e., you have not met the usual requirements for graduate standing, or you do not intend to become a formal candidate for a degree beyond the bachelor's 4
a student enrolled exclusively in courses conducted by correspondence, by radio, or television 5
a holder of a doctorate and doing postdoctoral work 6
none of the above 7

FIELDS AND CAREERS

The list of fields on pages 2 and 3 in the covering letter is to be used in answering Questions 19 through 25, 42D and I and 43D. As you choose the field from the list which is your answer to one of the questions below, please write the two numbers or letters of that field in the double box at the right of that question. For example, if "Mechanical Engineering" best describes your current major field, write its code number (16) in the double box at the end of Question 19, thus:

1	6

19. Your current major field of study? ☐☐ 61-62/XX

20. Your undergraduate major field of study? ☐☐ 63-64/XX

21. If you now hold Master's degree, in which field? (Write "yy" in the double box if you do not hold Master's degree) ☐☐ 65-66/XX

22. If you now hold a doctorate, in which field? (Write 'yy" in the double box if you do not hold a doctor's degree) ☐☐ 67-68/XX

23. Major field for highest degree you expect to hold? ☐☐ 69-70/XX

24. Your anticipated career field? (Please give the code number for what you expect to be your long-run career and ignore any stop-gap job, or temporary military service which might precede it)

IF YOU ARE A WOMAN: Use code number for "Housewife" (99) only if you do not expect to work at all. ☐☐ 71-72/XX

IN ADDITION to writing the code number in the double box, please describe your anticipated career field in a few words below.

____

____

25. A. What if you were free to choose any professional or graduate field from the list, ignoring obstacles such as finances, time for training, admission requirements, etc.. Would you still choose the field just listed?

Yes, I would still strongly prefer it to any other *(Circle "X" and skip to Question 26)* ....X — 73/Y
I could be tempted by one or more alternatives.................0
No, I would prefer one or more alternatives 1

B. Which of these alternative fields would you like the most? ☐☐ — 74-75/RR
(Please indicate the field in the double box)

Begin Deck 2

26. A. After completing your studies, which of the following do you expect as your first employer? as your long-run future employer? *(Circle one in each column)*

	First Employer	Long-run Career Employer
I plan to be self-employed, or in business owned by my family	Y	Y
Private company	X	X
Professional partnership	0	0
Research organization or institute	1	1
College or University	2	2
Junior College or Technical Institute	3	3
Elementary or Secondary School or School System	4	4
Hospital, Clinic, Church, Welfare, or other non-profit organization	5	5
Federal Government (U.S.) (Other than above)	6	6
State or Local Government (Other than above)	7	7
Other (Circle *and specify)*	8	8
Do not expect emplovment	9	9
	11/R	12/R

B. Is the employment described in "A" above located....

	First'	Long-run
in the United States?	8	8
in a foreign country?	9	9
	13/7	14/7

C. The following activities cut across a number of specific jobs. Which ones do you anticipate will be an important part of your long-run career work? *(Circle any which apply)*

Teaching ....2 — 15/1
Research and development.................3
Administration or management.................4
Service to patients or clients 5
None of the above 6

---

27. Which of these characteristics would be very important to you in picking a job or career? *(Circle as many as apply)*

Making a lot of money.................X — 16/Y
Opportunities to be original and creative.................0
Opportunities to be helpful to others or useful to society.................1
Avoiding a high pressure job which takes too much out of you.................2
Living and working in the world of ideas.................3
Freedom from supervision in my work.................4
Opportunities for moderate but steady progress rather than the chance of of extreme success or failure 5
A chance to exercise leadership 6
Opportunity to work with people rather than things.................7
None of the above 8

---

28. A. In the long run, would you rather be known and respected.... *(Circle one)*

where you work ....X — 17/Y
(OR)
among people in your profession 0

B. In the long run, would you rather be respected by.. *(Circle one)*

clients (students, customers) you serve ....5 — 18/4
(OR)
people (colleagues) with whom you work.................6

THE FOLLOWING QUESTIONS ASK ABOUT *ACADEMIC FINANCES* DURING THE 12 MONTHS FROM JULY, 1962 THROUGH JUNE, 1963

ACADEMIC FINANCES

29. **During the academic year July, 1962 through June, 1963, did you receive a stipend (scholarship, fellowship, research or teaching assistantship) or similar financial aid to students?** *(Circle one)*

EXCLUDE... loans and gifts from parents, relatives or any other source; exclude work performed as an instructor or assistant professor

INCLUDE... waiver or reduction in tuition fees even if you do not receive the money directly
include waiver or reduction of tuition and fees under cost of education allowances received by the university

INCLUDE... income from teaching or research in your field of study if paid as a graduate assistant by the school where you are enrolled or affiliated organization
include payment in kind, e.g., room and board

IF the funds are administered by the school you are attending but come from another source, e.g. a Federal agency such as the National Science Foundation or the National Institutes of Health, be sure to enter the code number for the Federal agency providing the funds.

Yes 8 19/7
No 9

If NO: Skip to Question 33.

IF YES: On page 4 of the covering letter is a set of code numbers that describe stipends by source and type. *Use the code numbers to answer the following questions:*

A. First stipend (if you have two or more, enter the code number of the one which has the highest value.) ☐☐ 20-21/XX

B. Second stipend?
If YES: Enter its code number in the double box
If NO: Write "yy" in the double box ☐☐ 22-23/XX

C. Third stipend?
If YES: Enter its code number in the double box
If NO: Write "yy" in the double box ☐☐ 24-25/XX

D. Please estimate the total value you received from each stipend during the period July, 1962 through June, 1963. Include your estimate of the value of a tuition scholarship, or reduction or waiver in tuition and fees (even if you received no money), income from teaching or research in your field if you were paid as a graduate assistant by the school or affiliated organization where you are enrolled.

(1) My first stipend: $
(2) My second stipend: $
(3) My third stipend: $

E. How many months of the twelve month period did each of these stipends cover?
(1) My first stipend: Months ☐ 26-27/RR
(2) My second stipend: Months ☐ 28-29/RR
(3) My third stipend: Months ☐ 30-31/RR

30. A. If you hold a duty stipend, what duties are required of you? *(Circle any which apply in each column)*

	First Stipend	Second Stipend	Third Stipend
Lead discussion or laboratory sections	4	Y	4
Lead seminars	5	X	5
Work on research project directed by someone else	6	0	6
Instruct undergraduate sections	7	1	7
Other duties *(Circle and specify)*	8	2	8
No duties are required	9	3	9
	32/R	33/R	34/R

B. On the average, how many hours per week do you give to these duties?
(If no duties, enter YY in box) Hours ☐ 35-36/RR ☐ 37-38/RR ☐ 39-40/RR

C. Aside from the purely financial aspects of the stipend, how would you rate these duties as a training experience? *(Circle one)*

An unusual opportunity for training in my field 1 41/R
A good opportunity for training in my field 2
A fair opportunity for training in my field 3
Irrelevant for training in my field 4
I have no duties 5

31. Did having a stipend this year lead you to do any of the following? *(Circle as many as apply)* 42/R

Shift field of specialization to area where more or better stipends were available . . . . Y
Attend this university although I preferred a different one X
Choose a master's thesis topic which didn't represent my real interest 0
Choose a doctoral thesis topic which didn't represent my real interest 1
Enroll part time although I would have preferred full-time studies 2
Enabled me to start graduate work sooner than otherwise possible 3
Allowed me to do the kind of research I really wanted 4
Choose this university from equally attractive ones 5
Take too long to get my degree because of duties attached to my stipend 8
None of the above 9

32. A. In order to hold any of your stipends and receive installments of the grant, are you required to maintain a specified grade point average? *(Circle one)* 43/R

No 7
Don't know 8
Yes 9

B. IF YES: What is it? If letter grades are not given, translate as best you can. *(Circle one)* 44/R

A	A—	B+	B	B—	C+	C or less	Don't know
0	1	2	3	4	5	6	9

33. IF YOU HAVE A STIPEND THIS YEAR, SKIP TO QUESTION 34.
Did not having a stipend *this year* lead you to do any of the following: *(Circle as many as apply)* 45/R

Shift field of specialization to area where more stipends were available . . . . Y
Attend this university although I preferred a different one X
Choose a master's thesis topic which didn't represent my real interest 0
Choose a doctoral thesis topic which didn't represent my real interest 1
Enroll part time although I would have preferred full-time studies 2
Delay graduate study after getting the bachelor's degree 6
Drop out of graduate school temporarily 7
Take too long to get my degree because of need for part-time work 8
None of the above 9

34. Did you *decline* any stipend that you were offered for the academic year 1962-1963? *(See page 4 of covering letter for a set of code numbers that describe stipends by source and type.)*

IF NO: Write "YY" in the double box. ☐☐ 46-47/XX

IF YES: Enter the code number for the one you were offered. (If you were offered more than one, give the code number for the "best" one.)

35. Did you apply for any stipend during the academic years 1962-1963 for which you were *not accepted?*

IF NO: Write "YY" in the double box. ☐☐ 48-49/XX

IF YES: Enter its code number. (If more than one rejection, give the code number for one stipend you would have preferred.)

36. A. Did you have a stipend for graduate study between July 1961 and June 1962? *(Circle one)* 50/X

Yes, I always had one *(Circle "O" and answer Column (A) below)* 0
No, I never had one *(Circle "1" and answer Column (B) below)* 1
I was an undergraduate student during this period. *(Circle "2" and skip to Question 37)* 2

B. What did getting (not getting) a stipend between July, 1961 and June, 1962 lead you to do? *(Circle any which apply)*

	July, 1961–June, 1962	
	(A) Getting a stipend	(B) Not getting stipend
Shift field of specialization to area where more or better stipends were available	Y	Y
Attend this university although I preferred a different one	X	X
Choose a master's thesis topic which didn't represent my real interest	0	0
Choose a doctoral thesis topic which didn't represent my real interest	1	1
Enroll part time although I would have preferred full-time studies	2	2
Enabled me to start graduate work sooner than otherwise possible	3	3
Allowed me to do the kind of research I really wanted	4	4
Choose this university from equally attractive ones	5	5
Delay graduate study after getting the bachelor's degree	6	6
Drop out of graduate school temporarily	7	7
Take too long to get my degree because of need for part-time work	8	8
None of the above	9	9
	51/R	52/R

YOUR PLANS NEXT YEAR

37. What will you be doing this Fall? *(Circle as many as apply)*

Working as a research assistant	0	53/X
Working as a teaching assistant	1	
Working full time at a type of job I expect to be my long-run career field	2	
In the military service (full-time active duty)	3	
Working full time at civilian job which will probably not be my long-run career	4	
Housewife	5	
Graduate study in an arts and science field (physical science, biological science, social science, humanities)	6	
Graduate study in a professional field (engineering, education, agriculture, social work, law, medicine, etc.)	7	
Working part time other than as research or teaching assistant	8	
Other *(Circle and Specify)*________________	9	

---

38. How definite are the plans encircled in Question 37? *(Circle one)*

Quite definite	X	54/Y
Fairly definite, but subject to change	0	
Quite indefinite	1	

---

39. A. Which of the following best describes your studies during the coming year (1963-64)?
Will continue studies in . . . *(Circle one)*

same field, same school	5	55/4
*same field, different school	6	
*different field, same school	7	
*different field, different school	8	
*will not be enrolled next year	9	

B. If you plan to go to school in the coming year: Will you go . . . . *(Circle one)*

full-time?	1	56/0
part-time?	2	

C. If not enrolled next year: Why? *(Circle any which apply)*

Work for degree will be completed *(Circle and skip to Question 42)*	6	57/5
Studying in absentia	7	
*Interrupting my studies temporarily	8	
*Quitting my studies short of the degree	9	

D. Why are you making the changes indicated (*) in A and C above?

____ 58/Y

____ 59/Y

---

40. A. Are you getting a stipend next year?

Yes	2	60/1
No *(Circle "3" and skip to Question 41)*	3	
Maybe *(Circle "4" and skip to Question 41)*	4	

B. IF YES: See page 4 of the covering letter for a set of code numbers that describe stipends by source and type.

(1) First stipend? If you have two or more, enter the code number of the one that has the highest value.	☐☐	61-62/RR
(2) Second stipend? IF YES: Enter its code number. IF NONE: Write "yy" in the double box	☐☐	63-64/RR
(3) Third stipend? IF YES: Enter its code number. IF NONE: Write "yy" in the double box	☐☐	65-66/RR

C. Please estimate the total amount you will receive from each stipend during the period July, 1963 through June, 1964. Include your estimate of the value of a tuition scholarship, or reduction or waiver in tuition or fees (even if you received no money), income from teaching or research in your field if you were paid as a graduate assistant by the school or affiliated organization where you are enrolled.

(1) My first stipend	$	67-68/RR
(2) My second stipend	$	69-70/RR
(3) My third stipend	$	71-72/RR

41. Will getting (not getting) a stipend influence your plans for next year?

Yes	8	73/7
No	9	

IF YES: What is the influence?

______________________________ 74/X

______________________________ 75/X

Begin Deck 3

YOUR EMPLOYMENT AND EARNINGS: JULY, 1962 THROUGH JUNE, 1963

42. A. Do (Did) you have employment other than that connected with a stipend during this academic year, i.e., June, 1962 through July, 1963? *(Circle one)*

EXCLUDE... occasional jobs of only a few days' duration
INCLUDE... self-employment
INCLUDE... summer 1962 employment

Yes	1	11/0
No *(Circle "2" and skip to Question 43)*	2	

B. How many months during the 12-month period were you working....

35 hours per week or more?	Months: ________	12-13/XX
20 - 34 hours per week?	Months: ________	14-15/XX
10 - 19 hours per week?	Months: ________	16-17/XX
Fewer than 10 hours per week?	Months: ________	18-19/XX

(Please make total equal 12 months)

C. Was there more than one job? *(Circle one)*

Yes	1	20/0
No	2	

IF YES: Consider the job you held longest during the twelve month period as the one you are describing below in parts D through H.

D. What field best describes this job? *(Inside the covering letter is a list of fields of employment and study. Enter the code number that best describes your job.)*

☐☐ 21-22/XX

E. This is.... *(Circle one)*

the kind of job I want in my anticipated career field	4	23/3
a job which is relevant to my anticipated career field but not the kind I want	5	
a job which has nothing to do with my antictipated career field	6	

F. Which of the following best describes your employer? *(Circle any which apply)*

I am self-employed, or in business owned by my family	Y	24/R
Private company	X	
Professional partnership	0	
Research organization or institute	1	
College or University at which I am enrolled	2	
Another college or university	3	
Junior College or Technical Institute	4	
Elementary or secondary school or school system	5	
Hospital or clinic, church, welfare, or other non profit organization	6	
Federal Government (U.S.) (Other than above)	7	
State or Local Government (Other than above)	8	
Other *(Circle and specify)* ________	9	

G. Which of the following duties best describe the job? *(Circle any which apply)*

Teaching	X	25/Y
Research and development	0	
Administration and management	1	
Service to patients or clients	2	
Other *(Circle and specify)* ________	3	

H. Are you currently working on this job? *(Circle one)*

Yes *(Circle "5" and skip to Quesion 43)*	5	26/4
No	6	

I. Do you have a job at which you currently working? Exclude duties connected with a stipend.

Yes	8	27/R
No	9	

IF YES: What field best describes your current job? *(Enter the code number in the double box.)*

☐☐ 28-29/RR

43. A. Have you ever held a *regular full-time* job of more than 6 months duration? *(Circle one)* 30/Y

Yes, my current job 0
Yes, but not now 1
No *(Circle "X" and skip to Question 44)* X

B. What were the monthly earnings before taxes of the highest paid regular full-time job you ever held? 31-32/YY

$

C. In which field was this highest paid regular full-time job? *(Circle one)* 33/5

It is the job I'm now holding 6
In the field of current employment, but it was a different job 7
Not in the field of current employment 8
In none of the above 9

D. IF NOT IN FIELD OF CURRENT EMPLOYMENT OR NOT NOW EMPLOYED:
Enter the code number from the list that best describes this job. 34-35/RR

44. How much debt did you incur for your undergraduate education which was still outstanding when you got your bachelor's degree? *(Circle one)* 36/2

None	Less than $500	$500 - $999	$1,000 - $1,999	$2,000 - $2,999	$3,000 - $4,499	$4,500 - and over
3	4	5	6	7	8	9

45. A. Which of the following types of loans did you use for financing your graduate studies? *(Circle any that apply in each column)*

	This year	Graduate study in previous years
Tuition deferred for more than 3 months	2	Y
Other payment deferred to the University more than 3 months	3	X
Cash borrowed from University	4	0
National Defense Education Loan	5	1
Banks and insurance companies	6	2
Family loans which are to be repaid	7	3
Other specifically education loan *(Circle and Specify)*	8	4
None of the above	9	5
	37/1	38/6

B. If you were to liquidate all your assets (i.e., equity in house and automobile, furniture, stocks, cash surrender value of life insurance, etc.), and pay off all your debts, how much money do you think would be left over? *(Circle one)* 39/Y

$0 — $999 0
$1,000 — $4,999 1
$5,000 — $9,999 2
$10,000 or more 3
I would still be in debt X

C. How much debt will you have by the end of June, 1963? Include balance on time purchases; exclude mortgage.

IF NONE: Draw a line in the box. $ 40-41/XX

D. What will be the balance on your home mortgage by the end of June, 1963?

IF NONE: Draw a line in the box. $ 42-43/XX

YOUR FINANCES

46. This question asks for financial *estimates.* Your individual answers will be kept completely confidential and will not be revealed to anyone. Only tabulations based on large numbers of students will be reported in this study. These will be extremely important in analyzing the financial problems of graduate students as a whole.

All the amounts should be for the whole year and should be strictly dollars amounts. For example, if you made about $100 per month on a part-time job for the twelve-month period, then enter

$ 1200

If you do not know the exact amount, enter your best estimate.
Please enter an amount in each box of the Financial Inventory.
If none, draw a line in the box

$ —

AN EXAMPLE OF A COMPLETED FINANCIAL INVENTORY IS PROVIDED IN THE ENCLOSURE ACCOMPANYING THIS QUESTIONNAIRE.

ESTIMATED FINANCES FOR THE YEAR BEGINNING JULY 1, 1962 AND ENDING JUNE 30, 1963

INCOMING

ANNUAL AMOUNTS
IN DOLLARS

MAKE LARGE, CLEAR NUMBERS

ESTIMATE FOR THE TIME
REMAINING TILL
JUNE 30, 1963

APPROXIMATIONS ARE O.K.!

I. YOUR STIPEND INCOME

TRANSFER THESE AMOUNTS, IF ANY, FROM QUESTION 29D

1st stipend	$
2nd stipend	$
3rd stipend	$

TOTAL ⟶ $

II. OTHER INCOME

*Part time and full time work (before taxes)	$
Parents and relatives (gifts)	$
Spouse's university job (before taxes)	$
Spouse's non-university job (before taxes)	$
Spouse's stipends	$
Veterans and GI benefits	$
Income from military service	$
†Other—excluding IV and V below	$

TOTAL ⟶ $

III. TOTAL OF I AND II ⟶ $

IV. REDUCTION IN ASSETS (Amounts): $

withdraw savings; sell stock, car, house, property, etc.

V. ADDITION TO LIABILITIES (Amounts):

National Defense Education Act loan	$
Other educational loans (e.g., deferred tuition)	$
Other: installment debt, mortgages obtained since July, 1962	$

TOTAL ⟶ $

VI. TOTAL OF III, IV, AND V ⟶ $

NOTE: Total IN (VI) and Total OUT (XII) should be equal. If not, please revise the amounts you have entered.

---

*If you have a faculty appointment as instructor, assistant professor, etc., include this salary.

†Other income includes interest from savings accounts; dividends from stocks and bonds; income from property; royalties; honoria; consultation and other professional activity. etc.

Deck

ESTIMATED FINANCES FOR THE YEAR BEGINNING
JULY 1, 1962 AND ENDING JUNE 30, 1963

OUTGOING

ANNUAL AMOUNTS
IN DOLLARS

MAKE LARGE, CLEAR NUMBERS

ESTIMATE FOR THE TIME
REMAINING TILL
JUNE 30, 1963

APPROXIMATIONS ARE O.K.!

VII. ACADEMIC EXPENSES (SELF)

A. TUITION AND FEES

Covered by stipend	$
Covered by cost of education allowances	$
Not covered by above	$

TOTAL ⟶ $

B. OTHER ACADEMIC EXPENSES

INCLUDE AMOUNTS COVERED BY STIPEND

Texts, reference books, journals	$
Instruments, equipment, supplies	$
Thesis expenses	$
Other, including tutorial costs	$

TOTAL ⟶ $

VIII. **TOTAL OF VII A AND VII B** ⟶ $

IX. OTHER EXPENSES (SELF AND DEPENDENTS)

INCLUDE AMOUNTS COVERED BY STIPEND

*Living expenses	$
†Transportation	$
‡Health and medical care	$
§Other, excluding X and XI below	$

TOTAL ⟶ $

X. ADDITION TO ASSETS (Amounts):
Amount added to savings: buy stock, total value of house or car purchased since July, 1962, etc. $

XI. REDUCTION IN LIABILITIES (Amounts):
Amount repaid on loan; principal payments on car or house purchased prior to July, 1962; payments for deferred tuition; time payments, etc. $

XII. **TOTAL OF VIII, IX, X, AND XI** ⟶ $

**NOTE: Total IN (VI) and Total OUT (XII) should be equal.
If not, please revise the amounts you have entered.**

*Housing; food, beverages; personal maintenance; utility bills. etc.
†Local public transportation; operate and maintain own car; travel etc.
‡Self and family: health insurance premiums; medical and dental bills; drugs, etc. Exclude expenses covered by health insurance.
§Entertainment, gifts, contributions; insurance, taxes; purchase of house furnishings and consumer durables; spouse's academic expenses. etc.

Deck 5

47. What is the least it would take to get you into graduate studies full-time? (*Circle only one*)

Doesn't apply to me as I am now studying full time	2	44/1
Tuition scholarship	3	
Tuition scholarship plus $500 stipend with no obligations	4	
Tuition scholarship plus $1,000 stipend with no obligations	5	
Tuition scholarship plus $2,000 stipend with no obligations	6	
Tuition scholarship plus $3,000 stipend with no obligations	7	
Tuition scholarship plus $4,000 stipend with no obligations	8	
None of the above would get me to go full time	9	

IF "NONE OF THE ABOVE": Why not?

______________________________ 45/R

____

BACKGROUND AND GENERAL INFORMATION

48. What is your sex? *(Circle one)*

Male	1	46/0
Female	2	

A. ANSWER IF FEMALE:

In the long run which one of the following do you really prefer and which one do you realistically expect? *(Circle one in each column)*

	Really prefer *(Circle one)*	Realistically expect *(Circle one)*
Housewife only	5	X
Housewife with occasional employment	6	0
Housewife for a few years, employment later	7	1
Housewife with regular employment	8	2
Employment only	9	3
	47/R	48/R

B. ANSWER IF MALE:

Have you ever served on *full-time active duty* in the armed services? *(Circle one)*

Yes	8	49/R
No	9	

IF YES: For how many years? *(Circle one)*

Less than one	0	50/R
One	1	
Two	2	
Three	3	
Four or More	4	

C. ANSWER IF MALE:

How has your present military status affected your plans for future education? *(Circle as many as apply)*

Not at all	5	51/R
An influence toward:		
postponing entry into my graduate studies	6	
beginning my graduate studies sooner	7	
interrupting my graduate studies	8	
not hurrying through my graduate studies	9	

49. Your date or birth:

Month	Day	Year

52-53/XX

50. Are you a U.S. citizen? *(Circle one)*

Yes, U.S. born	X	54/Y
Yes, naturalized	0	
No, but I expect to stay in the U.S.	1	
No, and I do not expect to stay in the U.S.	2	

51. Your racial background: *(Circle one)*

White (Caucasian)	5	55/4
Negro	6	
Oriental	7	
American Indian	8	
Other *(Circle and specify)* ______________	9	

52. What is your current marital status? *(Circle one)*

Single, no definite plans to be married at present	X	56/Y
Single, have definite plans to be married before Sept. 1, 1963	0	
Single, have definite plans to be married after Sept. 1, 1963	1	
Widowed, Divorced, Separated	2	
Married, no previous marriage	3	
Married, a previous marriage	4	

IF *EVER* MARRIED:

A. In what year were you first married? 19________ 57-58/RR

B. How many children do you have now *(Circle one)*

None	0	59/R
One	1	
Two	2	
Three	3	
Four or more	4	

C. What is the age of the oldest child? *(Fill in box.)*

IF YOU HAVE NO CHILDREN: enter "YY". ☐ 60-61/RR

IF NOW MARRIED AND NOT WIDOWED, DIVORCED OR SEPARATED, Answer D, E and F.

D. What is your spouse currently doing? *(Circle any which apply)*

Working at University	4	62/R
Working elsewhere	5	
Military service (full-time active duty)	6	
Housewife, mother	7	
Going to school	8	
Other *(Circle and specify)*________	9	

E. IF YOUR SPOUSE IS GOING TO SCHOOL: For what degree? *(Circle one)*

Bachelor's	X	63/R
Master's	0	
Doctor's	1	
None of the above	2	

F. If your spouse has a stipend this year:

Which? *(Enter the code number from the back of covering letter that best describes the stipend with the highest value.)* ☐☐ 64-65/RR

Estimate its total value $

---

53. How many persons (excluding yourself) receive 50 per cent or more of their financial support from you? (INCLUDE spouse, children, others). *Write the number in the box.*

Number of dependents: ☐ 66/Y

54. Where were you living when you were graduated from high school and where do you live now? *(Circle one in each column)*

		Home State at High School Graduation *(Circle one)*	Now Living *(Circle one)*
NEW ENGLAND	Conn., Maine, Mass., N.H., R.I., Vt.	X	X
MIDDLE ATLANTIC	N.J., N.Y., Pa.	0	0
EAST NORTH CENTRAL	Ill., Ind., Mich., Ohio, Wis.	1	1
WEST NORTH CENTRAL	Iowa, Kan., Minn., Mo., Nebr., N.D., S.D.	2	2
SOUTH ATLANTIC	Del., D.C., Md., Fla., Ga., N.C., S.C., Va, W.Va.	3	3
EAST SOUTH CENTRAL	Ala., Ky., Miss., Tenn.	4	4
WEST SOUTH CENTRAL	Ark., La., Okla., Texas	5	5
MOUNTAIN	Ariz., Colo., Ida., Mont., Nev., N.Mex., Utah, Wyo.	6	6
WEST	Calif., Ore., Wash., Alaska, Hawaii	7	7
CANADA		8	8
OTHER *(Circle and specify)*		9	9
		67/Y	68/Y

---

55. Please indicate both the religion in which you were reared and your present religious preference. *(Circle one in each row)*

	Protestant	Roman Catholic	Jewish	Other	None	
A. Religion in which you were reared *(Circle one)*	X	0	1	2	3	69/Y
B. Present religious preference *(Circle one)*	5	6	7	8	9	70/4

---

56. A. Where did you live when you were graduated from high school? *(Circle one)*

Farm	A town (not a suburb of a larger place) with a population of		A city or its suburbs (not part of a larger area) wih a population of			A major population center with a total area population of			
	Less than 2,500	2,500 to 9,999	10,000 to 24,999	25,000 to 49,999	50,000 to 99,999	100,000 to 249,999	250,000 to 999,999	1,000,000 or more	
1	2	3	4	5	6	7	8	9	71/0

B. Were you living . . . . *(Circle one)*

in the central city	X	72/Y
suburb	0	
other	1	

---

57. Where do you live? *(Circle one)*

With my parents	2	73/1
University dormitory	3	
University-owned apartment	4	
University pre-fab or trailer	5	
Room or apartment rented from a private landlord	6	
Single-family house, rented	7	
Single-family house, owned	8	
Other *(Circle and Specify)* ______________	9	

58. **Please indicate your parents' highest educational attainment at the time you were graduated from high school.** *(Circle one in each column)*

	Mother	Father
8th grade or less	4	Y
Part high school	5	X
High school graduate	6	0
Part college	7	1
College graduate	8	2
Graduate or professional degree	9	3
	74/3	75/4

---

59. **Which of the following categories best describes the usual occupation of your father when you were graduated from high school?** *(Circle one)*

Professional	1	76/0
Proprietor or manager	2	
Sales (Other than sales manager or administrator)	3	
Clerical	4	
Skilled worker	5	
Semi-skilled worker	6	
Service worker	7	
Unskilled worker	8	
Farmer or farm worker	9	
Retired *(Circle & indicate pre-retirement occupation above)*	Y	77/R
Deceased *(Circle & indicate above occupation before his death)*	X	

---

60. **Which of the following was the appropriate income category for your parents at the time you were graduated from high school. Consider annual income from all sources before taxes.** *(Circle one)*

Less than $5,000 per year	3	78/2
$5,000 — $7,499	4	
$7,500 — $9,999	5	
$10,000 — $14,999	6	
$15,000 — $19,999	7	
$20,000 and over	8	
I have no idea	9	

61. A. **Please write the name of the institution which you are attending:**

Institution	City	State

B. **In what school, college, or division (e. g., College of Engineering, College of Medicine, Graduate School of Arts and Sciences) are you enrolled?**

____

C. **In what department of that organizational unit?**

____

62. Your replies to this questionnaire are completely confidential, and absolutely no information of any kind about specific persons will be released to your school or anyone else. Your sealed questionnaire will be read only by the research staff in Chicago. Because we hope to follow up some of the students in the sample to learn more about graduate students, we must ask you the following:

PLEASE PRINT

A. YOUR NAME

First Name	Middle Name	Last Name

B. YOUR MOST LIKELY ADDRESS A YEAR FROM NOW

Name of residence hall, department, company, etc., if any

Street Address

City or Town	Zone	State or County

C. NAME AND ADDRESS OF SOMEONE WHO WILL KNOW WHERE YOU ARE OR COULD FORWARD A LETTER TO YOU IF YOU WERE NOT AT THE ADDRESS YOU LISTED ABOVE

First Name	Middle Name	Last Name

Street Address

City or Town	Zone	State or County

INSTRUCTIONS FOR RETURNING QUESTIONNAIRE

1. Please fold back on this line.

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2. Insert in envelope. (If you have been provided with a "window envelope", make sure that the address below is displayed.)

APPENDIX 5

UNIVERSE ESTIMATES

The percentage distributions among the five composite fields of graduate study, as presented in the text, will provide sufficient information about the graduate students in these fields of study for many readers of this report. Others may be interested in the number of graduate students represented by these percentages.

Universe estimates are feasible for the thirty-seven detailed fields of study and for the five composite fields, given the total number of American graduate students enrolled for advanced degrees in each of these fields. This was calculated from two sources: (1) the proportion of American graduate students seeking an advanced degree in each field as reported in Appendix 3, Table A; and (2) total enrollment figures for each of the fields (save engineering), as shown in the Office of Education Survey of Students Enrolled for Advanced Degrees: Fall, 1962.[1] This information is presented in Table A-5.1.

TABLE A-5.1

ESTIMATED ENROLLMENT OF AMERICAN GRADUATE STUDENTS SEEKING ADVANCED DEGREES IN THIRTY-SEVEN FIELDS OF STUDY, 1962-1963

Detailed and Composite Field	Enrollment, Fall, 1962	Per Cent American Graduate Students Seeking Advanced Degrees	Enrollment, American Graduate Students
General physical science . . .	486	94	456
All other earth and physical sciences	238	84	200
Astronomy	423	86	364
Chemistry	12,309	85	10,463
Physics	11,005	82	9,024
Geography	1,281	83	1,063
Geology and geophysics	2,489	86	2,141
Oceanography	238	85	202
Metallurgy	201	90	181
Meterology	374	86	322
Mathematics	14,121	88	12,426
Total physical sciences .			36,942

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[1] Enrollment figures for the engineering fields were derived from Tolliver and Armsby (1963, Table B).

TABLE A-5.1--Continued

Detailed and Composite Field	Enrollment, Fall, 1962	Per Cent American Graduate Students Seeking Advanced Degrees	Enrollment, American Graduate Students
All other engineering	13,016	79	10,283
Civil engineering	3,985	71	2,829
Chemical engineering	3,323	76	2,525
Electrical engineering	13,377	84	11,203
Mechanical engineering	7,131	80	5,704
Total engineering			32,544
All other biology	2,734	79	2,160
Anatomy	573	85	487
General biology	3,658	90	3,292
Biochemistry	2,006	77	1,545
Botany	1,398	84	1,174
Biophysics	352	86	302
Genetics	570	72	410
Microbiology	2,155	83	1,787
Pathology	286	71	203
Pharmacology	538	81	436
Physiology	1,061	82	870
Zoology	2,437	90	2,193
Agriculture	4,282	70	2,997
Forestry	713	79	563
Total life sciences			18,419
Psychology	11,344	90	10,210
Anthropology	1,338	89	1,191
Economics	6,429	79	5,079
Sociology	3,924	85	3,335
Total behavioral sciences			19,815
English	15,985	94	15,026
History	10,671	94	10,030
Total humanities			25,056
Social work	7,256	93	6,748
Total social work			6,748

Universe estimates of the number of stipend holders for each of the thirty-seven fields of study and for the five composite fields can be prepared given the information in the preceding table. For example, the above table shows that a total of 2,829 American graduate students were seeking degrees in civil engineering, while Table 2 of Appendix 3 shows that 62 per cent of American graduate students seeking advanced degrees in civil engineering held at least one stipend during the academic year 1962-63. We estimate that the number of American graduate students working for advanced degrees in civil engineering in the spring term, 1963, and who held at least one stipend during 1962-63 was (.62) (2,829) = 1,754.

Similarly, Table 2.1 (Chapter 2) shows that 80 per cent of the students in the life science composite field had some form of stipend support: of the 18,419 American students seeking advanced degrees in this composite field of study, 14,735 held at least one stipend during the academic year 1962-63.

Assume that an estimate is needed of the number of Stage I American graduate students holding stipends in the engineering composite field.[2] Table 2.10 (Chapter 2) shows that Stage I American graduate students seeking advanced degrees in engineering comprised 519/1,280 or 40.5 per cent of the students in this field, and that 58 per cent of the Stage I engineering students held at least one stipend during the period under study.

> Universe estimate of the Stage I American graduate students in the composite field of Engineering: (.405)(32,544) = 13,180.
>
> Universe estimate of Stage I American graduate students in the composite field of engineering holding at least one stipend: (.58)(13,180) = 7,644.

For the convenience of the reader interested in the numbers of graduate students represented by the percentage distributions, we have applied the above technique to selected tables. In reading these tables several technical facts should be kept in mind:

These tables represent the estimated number of American graduate students in a given catagory as of fall, 1962. They are based on the estimation procedure described above. That is, the universe sizes are taken from the final column of Table A-5.1.

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[2] These are first-year students.

The universe estimates were derived from tables which accompany the main body of the report or from tables which are similar to these. These tables represent proportions or percentages of the student population. The proportions were rounded to the nearest whole per cent. Because of this the universe estimates are not as precise as the reader may desire. Also, variations are attributable to different response rates for specific questions. Therefore, the sum of the estimates in a table will not always be equal to the estimate of a given sub-total or total, as these figures were independently percentaged. This also means that the sub-total and total universe estimates between tables will not be equal. It should clearly be kept in mind that these estimates are exactly that--estimates of the universe.

TABLE A-5.2

NONSTIPEND EMPLOYMENT AND COMPOSITE FIELD OF STUDY

(Estimated Numbers of Graduate Students)

Nonstipend Employment	Engineering	Humanities	Behavioral Science	Physical Science	Life Science	Total, Five Fields
Yes	28,991	16,260	13,360	22,446	9,560	89,177
No	11,841	10,396	9,675	20,719	13,203	67,274
Total	40,832	26,656	23,035	43,165	22,763	156,451

TABLE A-5.3

EXTENT OF NONSTIPEND EMPLOYMENT AND COMPOSITE FIELD OF GRADUATE STUDY

(Estimated Numbers of Graduate Students)

Extent of Nonstipend Employment	Engineering	Physical Science	Humanities	Life Science	Behavioral Science	Total, Five Fields
Regular full time: 10-12 months . . .	15,655	8,111	5,796	2,746	3,874	35,483
Sporadic full time: 4-9 months . . .	2,899	2,479	2,415	1,231	1,603	9,758
Occasional full time: 3 months or less	10,437	11,942	7,889	5,587	8,016	44,354
Not employed full time at all . . .	11,841	20,633	10,556	13,429	9,675	67,743

TABLE A-5.4

FIELD OF NONSTIPEND EMPLOYMENT AND COMPOSITE FIELD OF GRADUATE STUDY

(Estimated Numbers of Graduate Students)

Field of Nonstipend Employment	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total, Five Fields
Physical science	13,564	143	437	249	148	15,432
Engineering	2,967	25,899	175	249	295	28,293
Health field	212	114	787	249	148	1,715
Life science	843	114	5,682	498	443	8,574
Education	1,696	114	1,049	498	5,021	7,716
Behavioral science . . .	424	285	262	7,090	1,181	9,431
Humanities	424	285	87	746	4,430	5,144
Other	1,060	569	350	2,985	3,249	8,574
Not employed	21,971	12,372	14,022	10,596	11,889	70,716

TABLE A-5.5

NONSTIPEND EMPLOYER AND COMPOSITE FIELD OF GRADUATE STUDY

(Estimated Numbers of Graduate Students)

Nonstipend Employer	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total, Five Fields
Self-employed	863	408	455	921	1,333	4,694
Private company	16,834	24,091	2,959	4,377	4,532	54,758
Professional partnership	432	408	91	230	533	1,565
Research organization or institute	6,043	4,900	2,504	1,843	800	15,645
College or university at which enrolled	7,338	6,941	7,284	4,607	4,532	29,726
Another college or university	3,453	1,225	2,049	2,534	2,132	10,952
Junior college or technical institute . .	432	408	228	230	533	1,565
Elementary or secondary school system	3,022	163	2,504	921	7,997	12,516
Hospital, clinic, etc. . .	863	163	2,276	3,916	1,866	9,387
Federal government . . .	4,748	3,675	2,504	2,304	1,599	15,645
State, local government .	1,295	1,225	1,366	1,612	1,066	6,258
Other	1,293	817	683	2,073	1,597	6,258

TABLE A-5.6

STIPEND HOLDING AND COMPOSITE FIELD OF STUDY

(Estimated Numbers of American Graduate Students)

Field of Graduate Study	First Stipend	Second Stipend	Third Stipend
Life science	14,735	3,684	442
Physical science	27,263	8,842	1,842
Behavioral science	12,483	3,963	793
Engineering	19,852	5,207	976
Humanities	11,526	2,756	501
Total, five fields	87,566	25,208	3,980

TABLE A-5.7

TYPE OF FIRST BY TYPE OF SECOND STIPEND

(Estimated Numbers of American Graduate Students in Five Composite Fields of Study)

Type of First Stipend	Type of Second Stipend					Total	
	None	Scholarship	Fellowship	Research Assistantship	Teaching Assistantship	First	First and Second
Scholarship . . .	11,940	2,654	531	531	531	11,694	19,901
Fellowship . . .	17,248	1,327	2,654	1,328	2,654	25,208	27,861
Research Assistantship .	17,248	1,327	531	2,656	1,327	22,554	26,535
Teaching Assistantship .	17,248	1,327	1,327	2,656	1,327	23,882	29,189
Total, second stipend . .	63,684	6,634	3,507	5,634	1,634	87,566	

No stipend . . . 45,144

TABLE A-5.8

COMPOSITE FIELD OF STUDY AND TYPE OF STIPEND HELD

(Estimated Numbers of American Graduate Students Holding as Either First or Second Stipend)

Composite Field of Study	Type of Stipend			
	Scholarship	Fellowship	Research Assistantship	Teaching Assistantship
Life science	1,658	5,342	5,710	4,236
Physical science . .	5,158	7,737	8,842	11,789
Behavioral science .	2,180	4,756	4,756	3,369
Engineering	7,811	5,532	5,532	4,231
Humanities	3,257	3,257	1,002	5,262

TABLE A-5.9

TYPE OF FIRST STIPEND, TYPE OF SECOND STIPEND, COMPOSITE FIELD OF GRADUATE STUDY

(Estimated Numbers of American Graduate Students)

a) Physical Sciences

Type of First Stipend	Type of Second Stipend					Total	
	No Second	Scholarship	Fellowship	Research Assistantship	Teaching Assistantship	First	First and Second
Scholarship	2,579	368	-	147	147	3,316	5,158
Fellowship	4,053	368	737	368	1,105	7,000	7,737
Research assistantship .	5,158	368	368	737	737	7,000	8,842
Teaching assistantship .	6,632	737	737	1,105	737	9,947	11,789
Total second . . .	18,421	2,217	1,847	2,211	2,579	27,263	

No stipend 9,579

b) Engineering

Scholarship	5,532	976	-	130	130	6,834	7,811
Fellowship	3,580	325	325	651	651	5,207	5,532
Research assistantship .	3,254	651	325	325	325	4,556	5,532
Teaching assistantship .	2,604	325	130	325	325	3,254	4,231
Total second . . .	14,970	2,278	651	1,302	976	19,852	

No stipend 12,692

c) Life Sciences

Scholarship	921	184	74	74	2	1,289	1,658
Fellowship	3,684	184	368	184	368	4,973	5,342
Research assistantship .	4,052	184	184	368	368	5,157	5,710
Teaching assistantship .	2,579	184	184	368	184	3,500	4,236
Total second . . .	11,236	737	921	921	921	14,735	

No stipend 3,684

TABLE A-5.9--Continued

d) Behavioral Sciences

Type of First Stipend	Type of Second Stipend					Total	
	No Second	Scholar-ship	Fellow-ship	Research Assistant-ship	Teaching Assistant-ship	First	First and Second
Scholarship	991	198	-	79	79	1,189	2,180
Fellowship	3,170	198	396	396	198	4,359	4,756
Research assistantship	2,774	396	198	594	198	4,161	4,756
Teaching assistantship	1,783	198	198	396	198	2,972	3,369
Total second . .	8,719	991	594	1,387	793	12,483	

No stipend 7,332

e) Humanities

Scholarship	2,255	251	100	-	100	2,756	3,257
Fellowship	2,004	251	251	-	501	3,007	3,257
Research assistantship	752	100	100	100	-	1,002	1,002
Teaching assistantship	3,758	251	251	100	501	5,011	5,262
Total second . .	9,020	1,002	501	251	752	11,526	

No stipend 13,530

TABLE A-5.10

TYPE OF THIRD STIPEND

(Estimated Numbers of American Graduate Students)

Composite Field of Study	Type of Third Stipend			
	Scholarship	Fellowship	Research Assistantship	Teaching Assistantship
Physical science	5,894	4,053	8,842	5,526
Engineering	7,160	1,627	651	1,953
Life science	1,658	1,289	2,394	737
Behavioral science . . .	1,585	1,387	2,180	1,982
Humanities	1,253	1,253	1,253	501

TABLE A-5.11

SOURCE OF FIRST STIPEND AND COMPOSITE FIELD OF GRADUATE STUDY

(Estimated Numbers of American Graduate Students)

Donor of Stipend	Composite Field of Graduate Study					
	Physical Science	Engineering	Life Science	Behavioral Science	Humanities	Total Five Fields
Atomic Energy Commission	1,914	598	148	-	-	2,629
Department of Defense	1,093	1,197	148	251	116	2,629
National Science Foundation	4,101	1,396	2,364	628	-	8,763
Veterans Administration (excluding G.I. Bill)	109	80	-	251	-	351
National Aeronautics and Space Administration	273	598	59	50	-	876
Office of Education:						
National Defense Education Act	820	399	443	754	928	3,505
Other Office of Education	-	80	-	126	-	351
Public Health Service:						
National Institutes of Health Fellowship Program	273	80	886	1,131	46	2,629
NIH Training Grant and Traineeship Program	273	199	2,068	879	-	3,505
Other Public Health Service	273	199	443	503	-	1,753
Other Federal government	820	798	295	503	116	2,629
Total U.S. Government	10,115	5,785	6,795	4,900	1,160	29,795
Private Foundation, Philanthropic Organizations, etc.	820	798	295	628	1,044	3,505
Industrial or business corporation or firm . .	2,734	6,384	295	251	116	9,640
Directly from the school I am now attending .	10,935	5,386	4,727	4,900	7,192	33,300
The school I am attending, but I do not know the primary source	1,914	997	1,477	879	696	6,134
State or local government (U.S.)	273	399	886	754	1,160	4,382
Foreign Government or other foreign source	109	-	-	-	-	351
Other	273	199	148	251	348	876
Total non-U.S. Government	17,222	14,164	7,977	7,663	10,444	56,961
Total University	27,337	19,949	14,772	12,563	11,601	87,632
No Stipend	9,505	12,595	3,647	7,252	13,455	45,044

TABLE A-5.12

COMPOSITE FIELD OF GRADUATE STUDY, SOURCE AND TYPE OF FIRST STIPEND

(Estimated Numbers of American Graduate Students)[a]

a) Physical Science

Source of Stipend	Type of Stipend			
	Scholarship	Fellowship	Research Assistantship	Teaching Assistantship
Atomic Energy Commission	109	109	1,634	109
Department of Defense	109	109	817	-
National Science Foundation	272	2,996	817	-
Veterans Administration (excluding G.I. Bill)	-	109	-	-
National Aeronautics and Space Administration	109	109	109	-
Office of Education:				
National Defense Education Act	109	817	-	-
Other Office of Education	-	-	-	109
Public Health Service:				
National Institutes of Health Fellowship Program	109	109	109	-
NIH Training Grant and Traineeship Program	-	109	109	-
Other Public Health Service	109	109	109	-
Other Federal government	272	109	272	109
Private foundation, philanthropic organizations, etc.	109	545	272	109
Industrial or business corporation or firm	1,634	545	272	109
Directly from the school I am now attending	272	545	1,907	109
The school I am attending, but I do not know the primary source	109	109	545	7,899
State or local government (U.S.)	109	109	109	1,089
Foreign government or other foreign source	-	109	-	272
Other	109	109	109	109

No stipend. 9,605

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[a] Estimated from Table 2.6.

TABLE A-5.12--Continued

b) Engineering

Source of Stipend	Type of Stipend			
	Scholar-ship	Fellow-ship	Research Assistantship	Teaching Assistantship
Atomic Energy Commission	80	80	80	-
Department of Defense	399	80	598	-
National Science Foundation	80	997	399	-
Veterans Administration (excluding G.I. Bill)	80	-	-	-
National Aeronautics and Space Administration	399	80	80	-
Office of Education:				
National Defense Education Act	-	399	80	-
Other Office of Education . . .	-	80	-	-
Public Health Service:				
National Institutes of Health Fellowship Program	-	80	-	80
NIH Training Grant and Traineeship Program	-	80	80	-
Other Public Health Service	-	80	80	-
Other Federal government	199	80	399	-
Private foundation, philanthropic organization, etc.	80	598	80	-
Industrial or business corporation or firm	4,389	1,596	399	80
Directly from the school I am now attending	598	399	1,596	2,793
The school I am attending, but I do not know the primary source . . .	80	80	399	399
State or local government (U.S.) .	199	80	80	80
Foreign government or other foreign source	-	-	-	-
Other	80	80	80	80

No stipend 12,595

TABLE A-5.12--Continued

c) Life Science

Source of Stipend	Type of Stipend			
	Scholarship	Fellowship	Research Assistantship	Teaching Assistantship
Atomic Energy Commission	-	59	59	-
Department of Defense	59	59	-	-
National Science Foundation	59	1,447	590	59
Veterans Administration (excluding G.I. Bill)	-	-	-	-
National Aeronautics and Space Administration	-	-	59	-
Office of Education:				
National Defense Education Act .	-	295	59	-
Other Office of Education	-	-	-	-
Public Health Service:				
National Institutes of Health Fellowship Program	59	590	148	-
NIH Training Grant and Traineeship Program	-	1,329	443	148
Other Public Health Service	-	59	295	59
Other Federal government	59	59	295	-
Private foundation philanthropic organization, etc.	-	59	59	59
Industrial or business corporation or firm	59	59	148	59
Directly from the school I am now attending	295	295	1,477	2,659
The school I am attending, but I do not know the primary source . . .	59	148	886	443
State or local government (U.S.) .	443	59	295	59
Foreign government or other foreign source	-	-	-	-
Other	-	-	59	59

No stipend 3,647

TABLE A-5.12--Continued

d) Behavioral Science

Source of Stipend	Type of Stipend			
	Scholar-ship	Fellow-Ship	Research Assistantship	Teaching Assistantship
Atomic Energy Commission	-	-	-	-
Department of Defense	50	50	125	-
National Science Foundation	-	377	251	-
Veterans Administration (excluding G.I. Bill)	50	50	125	50
National Aeronautics and Space Administration	-	-	50	-
Office of Education:				
National Defense Education Act .	50	628	-	-
Other Office of Education	-	50	50	-
Public Health Service:				
National Institutes of Health Fellowship Program	50	508	125	50
NIH Training Grant and Traineeship Program	50	879	125	50
Other Public Health Service	-	125	251	-
Other Federal government	50	50	377	-
Private foundation, philanthropic organization, etc.	50	503	125	-
Industrial or business corporation or firm	125	125	50	-
Directly from the school I am now attending	503	503	1,507	2,387
The school I am attending, but I do not know the primary source . . .	50	50	503	251
State or local government (U.S.) .	125	125	251	125
Foreign government or other foreign source	-	-	-	-
Other	125	50	125	50

No stipend 7,252

TABLE A-5.12--Continued

e) Humanities

Source of Stipend	Type of Stipend			
	Scholarship	Fellowship	Research Assistantship	Teaching Assistantship
Atomic Energy Commission	-	-	-	-
Department of Defense	46	46	-	-
National Science Foundation	-	-	-	-
Veterans Administration (excluding G.I. Bill)	-	-	-	-
National Aeronautics and Space Administration	-	-	-	-
Office of Education:				
National Defense Education Act	46	812	46	46
Other Office of Education	-	-	-	-
Public Health Service:				
National Institutes of Health Fellowship Program	-	-	46	-
NIH Training Grant and Traineeship Program	-	-	-	-
Other Public Health Service	-	-	-	-
Other Federal government	46	46	46	-
Private foundation, philanthropic organization, etc.	116	812	46	46
Industrial or business corporation or firm	46	46	-	-
Directly from the school I am now attending	1,276	812	696	4,292
The school I am attending, but I do not know the primary source	116	232	46	232
State or local government (U.S.)	812	232	-	46
Foreign government or other foreign source	-	-	-	-
Other	46	46	46	46

No stipend 13,455

TABLE A-5.13

STIPENDS (SOURCE TYPE) HELD MOST FREQUENTLY BY AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS OF STUDY

(Estimated Numbers of American Graduate Students)

a) Physical Sciences

First Stipend	Second Stipend						Total	
	None	Teaching Assistantship from School	Fellowship from NSF	Research Assistantship from School	Scholarship from Industry	All Other	First	First and Second
Teaching assistantship from school	6,263	368	368	368	147	1,842	9,211	11,053
Fellowship from NSF	1,842	368	368	147	-	368	3,315	3,684
Research assistantship from school	1,474	368	147	147	-	368	2,211	2,947
Scholarship from industry . . .	1,474	-	-	-	147	147	1,474	1,474
All other . . .	7,368	1,105	147	368	-	1,842	11,053	13,632
Total second .	18,421	2,211	737	737	147	4,421	27,263	

No stipend 9,579

b) Engineering

First Stipend	Second Stipend						Total	
	None	Scholarship from Industry	Teaching Assistantship from School	Research Assistantship from School	Fellowship from Industry	All Other	First	First and Second
Scholarship from industry . . .	3,580	651	-	130	-	-	4,231	4,556
Teaching assistantship from school	2,278	-	130	130	-	325	3,254	3,905
Research assistantship from school	1,627	130	130	130	130	130	1,953	2,604
Fellowship from industry . . .	1,301	130	130	130	130	325	1,627	1,627
All other . . .	6,183	130	651	325	130	1,627	8,787	9,763
Total second .	15,296	976	976	651	130	2,604	20,177	

No stipend 12,692

TABLE A-5.13--Continued

c) Life Science

First Stipend	Second Stipend						Total	
	None	Teaching Assistantship from School	Research Assistantship from School	Fellowship from NIH	Fellowship from NSF	All Other	First	First and Second
Teaching assistantship from school	2,210	184	184	74	184	368	3,131	3,684
Research assistantship from school	2,026	74	74	-	-	184	2,394	2,763
Fellowship from NIH	1,474	184	74	74	-	184	2,026	2,210
Fellowship from NSF	1,105	184	74	-	184	184	1,474	1,658
All other . . .	4,236	368	184	74	74	921	5,894	6,815
Total second.	11,604	737	368	184	368	1,842	16,050	

No stipend 3,684

d) Behavioral Science

First Stipend	Second Stipend						Total	
	None	Teaching Assistantship from School	Research Assistantship from School	Fellowship from NIH	Fellowship from NDEA	All Other	First	First and Second
Teaching assistantship from school	1,585	198	198	-	79	594	2,774	3,170
Research assistantship from school	1,387	79	79	-	-	396	1,982	2,576
Fellowship from NIH	1,189	79	198	-	-	198	1,585	1,585
Fellowship from NDEA	396	79	79	-	79	198	594	793
All other . . .	4,161	198	198	79	79	991	5,746	7,133
Total second.	8,917	594	793	79	79	2,180	12,682	

No stipend 7,332

TABLE A-5.13--Continued

e) Humanities

First Stipend	Second Stipend						Total	
	None	Teaching Assistantship from School	Scholarship from School	Fellowship from Foundation	Fellowship from School	All Other	First	First and Second
Teaching assistantship from school	3,758	501	251	100	100	251	4,761	5,262
Scholarship from school .	1,002	100	251	100	-	100	1,503	2,004
Fellowship from foundation . .	752	100	100	100	-	100	752	1,002
Fellowship from school	752	251	100	-	100	-	1,002	1,253
All other . . .	2,756	251	251	-	100	501	3,758	4,009
Total second	9,271	1,002	752	100	251	752	11,776	

No stipend 13,530

TABLE A-5.14

CASH VALUE OF ALL STIPENDS HELD AND COMPOSITE FIELD OF GRADUATE STUDY, AMERICAN GRADUATE STUDENTS IN FIVE COMPOSITE FIELDS

(Estimated Numbers of American Graduate Students)

Composite Field of Study	Cash Value of All Stipends								Median Value (Approximate)
	None	Less than $999	$1,000-$1,499	$1,500-2,499	$2,500-2,999	$3,000-4,999	$5,000-7,999	$8,000 or More	
Life science	$3,500	$2,026	$ 737	$3,684	$2,947	$4,789	$ 553	$ 74	$2,700
Physical science	9,211	4,053	1,474	7,000	4,421	9,579	737	147	2,646
Behavioral science . . .	7,133	1,585	991	3,963	2,180	3,369	594	79	2,350
Engineering	12,367	6,834	1,302	3,254	2,604	4,882	976	325	2,200
Humanities	13,280	3,007	752	4,260	1,503	2,255	100	-	2,000
Total all fields .	43,783	17,247	5,307	22,555	14,594	25,208	2,654	531	

APPENDIX 6

SAMPLING ERROR COMPUTATIONS FOR STUDY OF GRADUATE STUDENT FINANCES

By

Seymour Sudman

The complex fashion in which this sample was selected clearly makes the use of simple random sampling error formulas inappropriate. In the first place, thirteen of the fields were sampled completely so that the sampling error for them is zero. In most other fields, the proportion of students sampled as a fraction of the total universe is large enough so that the finite correction factor becomes important. The use of the finite correction factor, of course, implies that we are considering all the students in a field during 1962-63 as the total universe, and not as a sample in time of past and future students in that field.

Second, the sample of graduate students is clustered, which would tend to increase the sampling variability. Based on comparisons of many items, it is conservatively estimated that the intraclass correlation δ is about .1, so that the variance of the cluster estimates is about 1.9 times as large as the variance of a simple random sample of the same size. This comes from the formula in Hansen, Hurwitz, and Madow (1953, pp. 259 ff.):

$$S^2_{\text{cluster}} = S^2_{\text{random}} \quad [1 + \delta(\tilde{n} - 1)],$$

where $\tilde{n}$ the average cluster size is 10 here.

To facilitate computations, the finite correction factor and cluster factor have been combined in Table A-6.1 to give a factor for each field which can be multiplied by the simple random sampling error formulas to estimate the true standard errors. The random sampling error formulas for various sample sizes and proportions are shown in Table A-6.2. Combining the two tables should enable the reader to estimate the standard error with one multiplication.

As an example, consider the finding that 19 per cent of the graduate students in chemistry hold no stipends. From Table A-6.1, the field factor for chemistry is 1.33. Since the percentage is based on 576 cases the random sampling error from Table A-6.2 is 1.6 per cent. Multiplying 1.33 x 1.6 gives 2.1 per cent which is the estimated absolute standard error. Thus at the two sigma level, the estimate of 19 per cent could be as low as 14.8 per cent or as high as 23.2 per cent.

TABLE A-6.1

FIELD FACTORS FOR COMPUTING SAMPLING ERRORS

Detailed Field of Study	Factor $\sqrt{(1-f)\,[1+\delta\,(\tilde{n}-1)]}$
Agriculture	1.20
General biology	1.14
Botany	.88
Zoology	1.11
Microbiology	1.06
Biochemistry	1.04
Biophysics	0
Anatomy	0
Genetics	0
Pathology	0
Pharmacology	0
Physiology	0
All other biology	1.24
Social work	1.25
English	1.34
Forestry	0
Geography	.36
Mathematics	1.34
General physical science	0
Astronomy	0
Chemistry	1.33
Metallurgy	0
Meteorology	0
Physics	1.33
Geology and geophysics	1.14
Oceanography	0
Other earth and physical science	0
Psychology	1.28
Anthropology	.75
Economics	1.24
History	1.31
Sociology	1.19
Chemical engineering	1.06
Civil engineering	1.14
Electrical engineering	1.30
Mechanical engineering	1.22
Other engineering	1.29
Composite field of study:	
Life sciences	.92
Physical sciences	1.23
Behavioral sciences	1.22
Engineering	1.25
Humanities	1.33

TABLE A-6.2

RANDOM SAMPLING ERRORS FOR VARIOUS SAMPLE SIZES AND PROPORTIONS (1 STANDARD ERROR)

Proportion (Per Cent)	Sample Size (Per Cent)					
	100	200	400	600	800	1,000
5-95	2.2	1.5	1.1	0.9	0.8	0.7
10-90	3.0	2.1	1.5	1.2	1.1	0.9
20-80	4.0	2.8	2.0	1.6	1.4	1.3
30-70	4.6	3.2	2.3	1.8	1.6	1.4
40-60	4.9	3.5	2.4	2.0	1.7	1.5
50-50	5.0	3.5	2.5	2.0	1.8	1.6

APPENDIX 7

A NOTE ON THE VALIDITY OF STUDENT RESPONSES

Throughout the report many relationships were presented that involve the source of the stipend reported by students in the sample. It was shown, for example, that Federal and non-Federal agencies differed in the types of support offered and in the levels of support made available among different fields of graduate study. Similarly, agencies within the Federal government were shown to differ in respect to these aspects of graduate education.

While these findings were informative, it would be helpful to have independent evidence on the validity of student designations of supporting agencies. To meet this need, NORC and the National Science Foundation (NSF) collaborated on a study to assess the accuracy of reporting among students in the total sample who indicated they secured stipend support in the form of a fellowship (defined in the Graduate Student Finance Survey as a "duty-free stipend for tuition plus a cash grant") from the National Science Foundation.

A total of 20,114 students returned usable questionnaires by the time field operations were terminated. Questionnaires were extracted from the files for students who reported an NSF fellowship during 1962-63 as their first, second, or third stipend. A total of 758 students were located who reported at least one NSF fellowship (seven of these students held two NSF fellowships). The remaining questionnaires were alphabetized.

Lists were received from NSF for selected NSF fellowship programs. These lists were alphabetized and compared with the two lists at NORC. Further investigation of the status of students reporting themselves to be NSF fellows was conducted in the Fellowship Section of NSF and in other programs conducted by the Foundation. The results are shown in Table A-7.1.

Over two out of three students (67 per cent) identifying themselves as NSF fellows were so listed on the rosters of the several Foundation fellowship programs. Most of the remainder, of course, had some form of NSF support, but it did not fall within the definition of "fellowship" employed at the Foundation. Thus Institute participants (21 per cent of the cases) were recipients of "non-duty stipends covering tuition plus a cash grant," which is the definition of "fellowship" employed in this study. Seventy-four students were not identified by NSF as recipients of a fellowship despite their reporting this to be the case in the course of the survey;

TABLE A-7.1

NATIONAL SCIENCE FOUNDATION PROGRAM STATUS OF STUDENTS REPORTING THEMSELVES AS NSF FELLOWS, 1962-63, IN THE GRADUATE STUDENT FINANCE SURVEY

NSF Program	N	Per Cent
Fellowship programs[a]	509	67
Institutes[b]	158	21
Special projects in science education	17	2
Not identified as a recipient . . .	74	10
Total	758[c]	100

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[a] The following fellowship programs: (1) Cooperative Graduate Fellowship Program for Fiscal Year 1962--Fellowship Awards; (2) Graduate Fellowship Program for Fiscal Year 1962--Fellowship Awards; (3) Program of Summer Fellowships for Graduate Teaching Assistants for Fiscal Year 1962; (4) lists for the cooperative and the graduate fellowship programs for the prior fiscal year, and for the teaching assistant program for the prior summer. (These latter lists did not cover the span of time relevant to the survey but were included presumably on the assumption of the possibility of some deferred starters who would be fellows in the relevant period [fiscal year 1962] and not appear on the relevant list.) (5) Science Faculty Fellowship Program; and (6) Summer Fellowships for Secondary School Teachers.

[b] The following Institute Programs: (1) 1962 summer; (2) 1962-63 academic year; and (3) 1962-63 in-service.

[c] Excluded are 22 students listed as bonafide NSF Fellows by the Foundation who failed to provide this information in the course of filling out their questionnaires.

an additional search of other Institute programs not covered to date, and a pairing of names with participants of other Foundation programs such as Advanced Science Seminars, Supplementary Training for Science Teachers, etc., would have further reduced the number in this group.[1] Finally, a number of graduate students working on research supported by the Foundation possibly misclassified their type of support.

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[1] Personal communication from William A. Jaracz, Study Director, Science Education Studies Group, Office of Economic and Manpower Studies.

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